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Adherence to e-therapy for adults with eating disorders: a systematic review

A retrospective case series investigation of blended internet-based cognitive-behavioural therapy (ICBT) and face-to-face cognitive-behavioural therapy (CBT) in the treatment of adults with eating disorders

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THE UNIVERSITY
of EDINBURGH

Doctorate in Clinical Psychology 2017

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DClinPsychol Declaration of Own Work

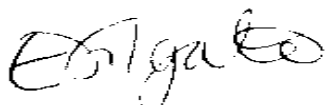
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Title of Work:	Adherence to e-therapy for adults with eating disorders: a systematic review. A retrospective case series investigation of blended internet-based cognitive-behavioural therapy (ICBT) and face-to-face cognitive-behavioural therapy (CBT) in the treatment of adults with eating disorders.

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Date 30th October 2017

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Chapter 1: Thesis Portfolio Abstract

Background: Eating disorder (ED) researchers continue to explore the effectiveness of e-therapy in improving symptoms and its treatment acceptability, however issues relating to poor uptake, adherence and dropout pose a challenge. Within this portfolio, the systematic review aimed to explore adherence to e-therapy for the treatment of ED, specifically exploring rates and predictors of uptake, completion, and dropout from randomised controlled trials (RCT) of ED e-therapy. The empirical project aimed to explore in-depth symptom change for ED cases engaged in blended internet-based cognitive behavioural therapy (ICBT) and face-to-face ED input. Acceptability of blended input was also explored.

Methods: For the systematic review, literature searches were undertaken in March and September 2017 across EMBASE, PsycINFO, MEDLINE, Ovid and Cochrane Central Register of Controlled Trials (CENTRAL) and ProQuest databases. Key papers were assessed against five quality criteria (random assignment to groups, blinding to treatment allocation, quality of content, level of contact, sample size with sufficient power). Using a retrospective case series design, the empirical project explored changes over time of ED, anxiety, depression, quality of life (QoL), motivation for change, overall psychological functioning and clinician-rated/patient-rated improvement. Standardised health assessment measures captured symptoms over multiple time-points, and data was analysed using t-tests, multi-level modelling (MLM) and visual analysis. Acceptability of treatment was tentatively explored using an open feedback questionnaire.

Results: Systematic review results identified intervention (content, acceptability, delivery method/location), participant (nature of symptoms, BMI, education, prior therapy, personality, views on e-therapy) and therapist-related factors (therapeutic support) were indicated in predicting uptake, completion and dropout across ED e-therapy. In the empirical project, study findings were inconclusive regarding symptom change attributable to blended input. Model fit improved when severity of ED symptoms predicted overall psychological functioning and patient-rated improvement over time, however findings were non-significant – potentially due to the study being underpowered.

Conclusions: Promising evidence exists for ED e-therapy as an acceptable treatment option, however understanding which content nurtures engagement best is needed. Further research is needed into the factors predicting ED blended treatment outcome.

Chapter 2: Systematic Review Journal Article

Adherence to e-therapy for adults with eating disorders: a systematic review

Written in accordance with guidelines by European Eating Disorders Review
(Appendix A)

Keywords:

e-therapy, internet, eating disorders, adherence, uptake, dropout

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Systematic Review Abstract

Background: Eating disorder treatment in adults is challenged by poor help-seeking, ambivalence and low motivation. Researchers exploring alternative treatments to overcome these difficulties indicate e-therapy for eating disorders (ED), however uptake, adherence and dropout issues persist. There is a paucity of literature exploring predictors of adherence and dropout in e-therapy so this systematic review aims to address this by exploring rates and possible predicting factors connected to adherence and dropout for randomised controlled trials of e-therapy for ED.

Methods: A literature search was undertaken in March 2017 across EMBASE, PsycINFO, MEDLINE, Ovid and Cochrane Central Register of Controlled Trials (CENTRAL) databases, with grey literature explored via the ProQuest database. In total, 14 papers were identified, data was extracted, and papers rated against five quality criteria (derived from e-therapy research as pertinent to adherence and dropout); random assignment to groups, blinding to treatment allocation, quality of content, level of contact, sample size with sufficient power.

Results: Factors indicated in predicting uptake, completion and dropout across e-therapy for ED emerged as intervention-related (content, acceptability), participant-related (BMI, education, prior therapy, personality) and therapist-related (therapeutic support). Causal relationships between these factors and adherence/dropout from e-therapy cannot be made due to heterogeneity of e-therapy and the subsequent lack of rigorous statistical analysis possible.

Conclusions: Further exploration of content that nurtures engagement, plus exploration of treatment acceptability of e-therapy for ED is required. An exploration of factors to improve uptake and adherence to e-therapy is required to inform e-therapy programme developments.

Introduction

E-therapy for eating disorders

Adults with eating disorders often present with difficulties help-seeking, consequently researchers are looking at alternative approaches to overcome these barriers (Kendal, Kirk, Elvey, Catchpole, & Pryjmahuk, 2016). Low eating disorder recovery rates (Herzog et al., 1999; WHO, 2004) and high mortality rates (Arcelus, Mitchell, & Wales, 2011), put pressure on researchers to develop appealing and accessible eating disorders treatments. “E-therapy” is the term used to describe technology-assisted treatment, and for the purposes of this paper is used to describe interventions delivered via the internet, online, web, computer or mobile applications platforms (Loucas et al., 2014). It is a well-evidenced treatment option within anxiety and depression literature, with Computerised Cognitive Behavioural Therapy (CCBT) recommended for conditions including social anxiety, panic disorder, obsessive compulsive disorder and specific phobias (NICE, 2014). Improving accessibility to treatment, CCBT programmes like “Beating the Blues” (BTB) are now established as recommended therapy options, in this case for treating depression (NICE, 2013), and serve as a valuable contribution as evidence suggests BTB provides similar outcomes to face-to-face Cognitive Behavioural Therapy (CBT) (Cavanagh, Seccombe, & Lidbetter, 2011). In the eating disorder population, e-therapy appears promising (Leung, Ma, & Russell, 2012), and has demonstrated utility in overcoming barriers for individuals lacking access to specialist treatment (Shingleton, Richards, & Thompson-Brenner, 2013). Nevertheless, good quality research is limited to prevention studies primarily, with further exploration recommended into the effectiveness of e-therapy for eating disorders using rigorous methodologies (Loucas et al., 2014). Fortunately, studies suggest that e-therapy is acceptable, for example individuals with Bulimia Nervosa (BN) expressing positive attitudes towards online self-help (Mcclay, Waters, Schmidt, & Williams, 2016), and individuals with Anorexia Nervosa (AN) reporting email a helpful therapeutic adjunct to treatment (Yager., 2001). Eating disorder researchers are building the evidence for effective e-therapies across platforms, however common issues relating to uptake and adherence are pertinent, as with increased autonomy comes increased dropout risk.

Adherence to e-therapy

Research suggests that some individuals with eating disorders are ambivalent about treatment and lack motivation to make changes, occasionally seeking treatment under pressure from others (Feld, Woodside, Kaplan, Olmsted, & Carter, 2001). Disorder-related differences in motivation have been observed, with some evidence suggesting AN patients appear less motivated, compared to those with BN (Blake, Turnbull, & Treasure, 1997). Ambivalence and motivation impact on subsequent adherence to treatment, and although adherence is reportedly good for e-therapy (Christensen, Griffiths, & Farrer, 2009), eating disorders have been shown in the research base to be difficult to treat, often troubled with high drop-out rates (Halmi, 2005).

The question therefore arises as to what may influence adherence to e-therapy in eating disorders? Limited research of methodological quality exists into adherence and e-therapy for eating disorders (Beintner, Jacobi, & Schmidt, 2014; Christensen et al., 2009). Evidence suggests good quality programme content (Wagner et al., 2013) and therapist contact (Aardoom, Dingemans, Fokkema, Spinhoven, & Van Furth, 2017; Wagner et al., 2016) are two factors deemed to impact on adherence and dropout, and these were areas of focus for this review. This systematic review therefore aims to explore rates and predictors of adherence and dropout from eating disorder e-therapy in randomised controlled trials (RCTs), in order to inform future research directions in enhancing eating disorder patients' engagement in e-therapy.

Methods

This systematic review used internationally-accepted guidance outlined by the Centre for Reviews and Dissemination (CRD) at the University of York for undertaking systematic reviews (see <http://www.york.ac.uk/crd/guidance>). Drawing on information presented in this guidance, the PICO process provided a framework for the search strategy outlined below.

Inclusion and exclusion criteria

Population: The following population inclusion/exclusion criterion was used to identify suitable studies for this systematic review:

Table 1: Inclusion and exclusion criteria

<i>Inclusion criteria</i>	<i>Exclusion criteria</i>
Adults with an eating disorder diagnosis (according to DSM/ICD diagnostic criteria)	Sub-threshold symptoms of eating disorders
Individuals aged 18-70 years old	Children, adolescent or elderly populations
Randomised controlled trial (RCT) studies	Non-RCT study method
Studies reported in English Language only (NB. Translation facilities unfeasible)	Studies lacking information to calculate completion/adherence or dropout/attrition rates
E-therapy treatment programmes (internet/computer/online/web/ CD-ROM, mobile)	E-therapy prevention or relapse-prevention programmes

Interventions: A universal definition for health care treatments delivered via technology does not yet exist, consequently this review considered any treatment delivered via the internet, online, websites, computer, CD-ROM or mobile platforms as eligible for inclusion, if using randomised controlled trial (RCT) methodology. Systematic reviews, meta-analyses, study protocols and economic evaluation studies were excluded. Studies also using technology to enhance face-to-face treatment, virtual reality treatment, and clinician-delivered interventions leveraging platforms to transmit content (e.g. videoconferencing) were excluded.

Control/comparator: Control conditions varied across RCT studies so inclusion criteria were broad to encompass all ethically appropriate options. Eligible control groups were; treatment as usual, waitlist alternatives, e-health programmes without a ‘therapy’ aspect, and non-eating disordered controls. Evidence suggests that delayed waitlist controls are pragmatic and available, and reportedly show no deterioration in symptoms (Elliott & Brown, 2002), so offer low-cost, ethically acceptable alternatives.

Outcomes: Primary outcomes of interest in this review were adherence and dropout rates from e-therapy for eating disorders. In this review, adherence was the extent participants access e-therapy content, and dropout was the individuals not completing the trial (Christensen et al., 2009). Factors connected to attrition rates for e-therapy in treating eating disorders (therapist input, illness severity, type of intervention), were additional outcomes of interest.

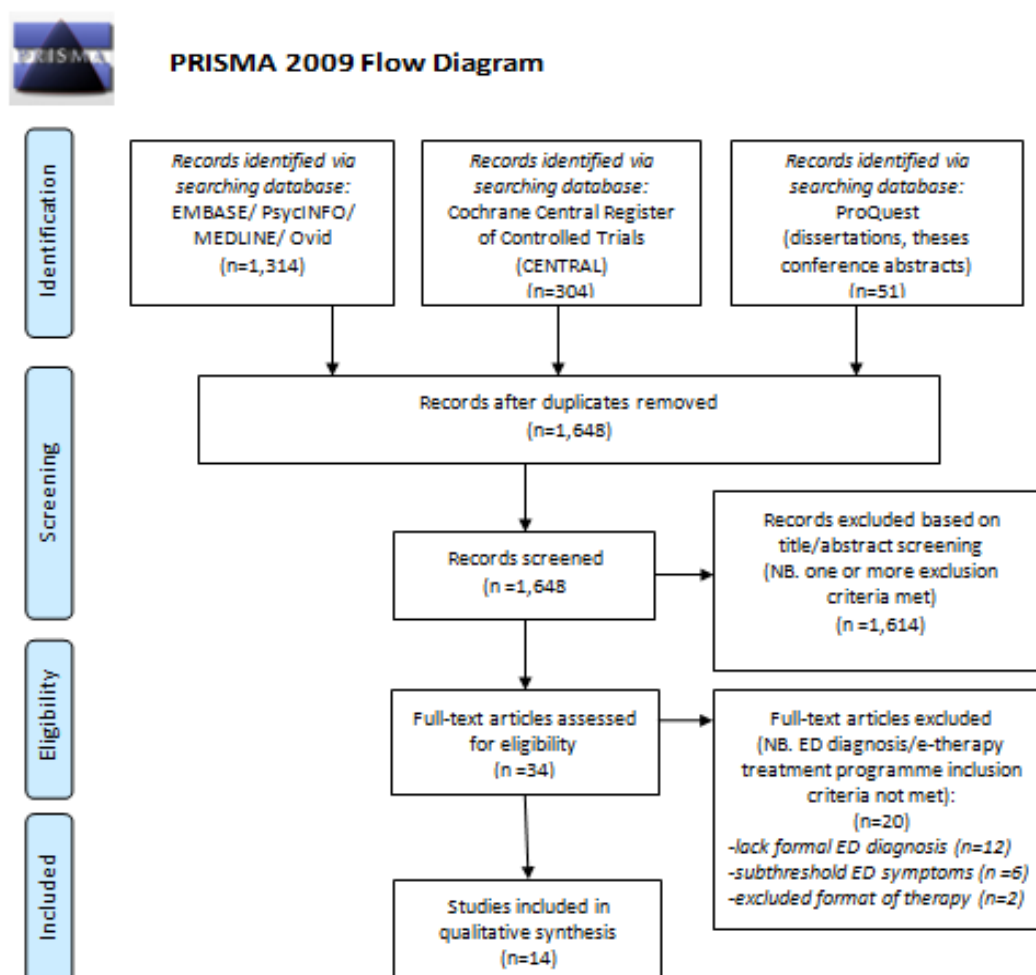


Figure 1. A PRISMA flow diagram illustrating the literature search process

Search strategy

An initial search was undertaken in October 2016 using PROSPERO, the international register of systematic reviews (www.crd.york.ac.uk), to identify if this review topic was completed recently. No reviews were identified so this systematic

protocol was registered (PROSPERO ID: CRD42017054685). A systematic search of papers via the EMBASE, PsycINFO, MEDLINE, Ovid and Cochrane Central Register of Controlled Trials (CENTRAL) databases was subsequently undertaken during March 2017 to retrieve relevant research. Grey literature was identified through the ProQuest database searching dissertations, theses and conference abstracts of unpublished research. The search terms were:

(online or web* or "e-therap*" or computer* or internet or "e-mental health" or mhealth or CCBT or ICBT or telemedicine or telehealth or mobile) AND (bulimi* or anorexi* or "binge eat*" or purg* or "eating disorder*" or "disordered eating" or EDNOS or OSFED or UFED) AND (Trial).

The database search yielded 1,669 papers, with 1,648 remaining after duplicate removal (see Figure 1). During first screening of study titles and abstracts against inclusion criteria, 1,614 papers were removed for meeting one or more exclusion criteria. A further 20 papers were excluded at second screening for not meeting eating disorder diagnosis and/or the e-therapy treatment programme inclusion criteria (see Appendix B for excluded papers). Three protocol authors identified during searching were contacted regarding unpublished results (Castelnuovo et al., 2011; Zwaan et al., 2012, Klein, 2011), with one detailing results were under journal review and not available within this review's timescales (De Zwaan et al., 2012).

Data was extracted using a template developed for this specific review (detailed in Table 2), with information on study characteristics synthesised to explore the nature of intervention/control group within studies (type of e-therapy, duration, therapist support, financial incentives) and sample characteristics (diagnosis, sample size, sex, mean age, mean duration of illness, previous eating disorder treatment). Adherence and dropout information was extracted, and where not explicitly provided, was calculated by the author and additional information deemed useful was extracted.

Assessment of quality of included studies

CRD guidance indicates a standard quality assessment scale for undertaking systematic reviews is yet to be reached (Centre for Reviews and Dissemination,

2009). No single approach to assessing methodological quality of studies exists, and considering the focus of this review focused on this, the CRD recommends a combination of contextual, pragmatic and methodological considerations (Centre for Reviews and Dissemination, 2009). Five quality criteria relevant to adherence in e-therapy for eating disorders were used to rate studies on methodological quality; the Cochrane Risk of Bias assessment tool (Higgins & Green, 2011), Scottish Intercollegiate Guidance Network (SIGN) methodological quality of RCTs assessment, CREST (Peck, Dow, & Goodall, 2012), and recommendations from research (Aardoom, Dingemans, Fokkema, Spinhoven, & Van Furth, 2017; Ter Huurne, De Haan, Postel, & Palen, 2015; Ter Huurne, Postel, de Haan, Van der Palen, & DeJong, 2017; Wagner et al., 2016). Subsequently, the quality criteria were random assignment to groups (SIGN), blinding to treatment allocation (SIGN), quality of content (Wagner et al., 2013), level of contact (Aardoom et al., 2017; Wagner et al., 2016) and sample size with sufficient power (CREST). These quality criteria were deemed important to this review question, as conceptually if studies lacked methodological rigour, then adherence and dropout information synthesised would not be a valid representation of the ED population being investigated.

Quality assessment of studies was completed utilising the outcome ratings: well-covered (2 points), adequately addressed (1 point) and poorly addressed or not addressed (0 points) (Coull & Morris, 2011) - Appendix C summarises quality criteria descriptions. An independent rater reviewed 50% of papers, and exact agreement was obtained on 86% of quality ratings. For the 14% where agreement was not achieved, through discussion differences were resolved following further details provided by the author on criterion. There was limited scope for a meta-analysis due to the heterogeneity of reviewed studies (varying programme design/content/duration). Consequently, this narrative synthesis of findings is focussed on the type of intervention, target population characteristics, and exploring possible factors impacting on adherence, completion and drop-out.

Results

Characteristics of studies

14 studies in total were identified between July 2006 and March 2017 as meeting inclusion criteria. Of those, 6 papers shared 3 pairs of data (Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, Treasure, & Schmidt, 2011; Ter Huurne, De Haan, Postel, et al., 2015; Ter Huurne et al., 2017; Watson et al., 2016; Zerwas et al., 2016), specifically authors used the same data set but explored different aspects. All studies were RCTs, with three papers describing e-therapy pilot studies (Brockmeyer et al., 2014; Nevenon, Mark, Levin, Lindström, & Paulson-Karlsson, 2006b; Robinson & Serfaty, 2008). In terms of therapy model, cognitive-behavioural therapy (CBT), programmes ‘based-on’ CBT, cognitive remediation therapy (CRT), and CBT/ Acceptance and Commitment Therapy (ACT) combined were used across studies. In terms of duration, all e-therapy programmes lasted between 3 weeks and 6 months in duration, and leveraged various platforms. Full details of e-therapy programmes and sample characteristics, along with a summary of adherence and dropout rates, and predictors of adherence and dropout are presented in Table 2.

Quality rating of papers

Study quality ratings are presented in Table 3, detailing how each paper scored against each of the five quality criteria. The quality rating scale utilised is not an exact comparative measure across studies, however broadly-speaking it provides a guide to methodological strengths of individual studies (Coull & Morris, 2011). Three papers achieved highest methodological quality, scoring 9/10 (Hogdahl, Levallius, Bjorck, Norring, & Birgegard, 2016; Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, Treasure, & Schmidt, 2011), with over half of reviewed studies achieving above average quality ratings. The majority of studies utilised good randomisation strategies, except two studies whereby one used consecutive eating disorder cases along with randomised controls from the Civic Register (Nevenon, Mark, Levin, Lindström, & Paulson-Karlsson, 2006a), and another consecutively assigning individuals into treatment or control conditions

(Carrard et al., 2011). Only one study fully implemented blinding to group allocation with participants in both intervention and control conditions receiving ICBT (Hogdahl, Levallius, Bjorck, Norring, & Birgegard, 2016).

Seven studies adequately addressed blinding, as although participants were aware of group allocation, performance bias was minimised by all ultimately receiving the intervention as a delayed waitlist (Robinson & Serfaty, 2008; Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, Treasure, & Schmidt, 2011; Strandskov et al., 2017; Ter Huurne, De Haan, Postel, & Palen, 2015; Ter Huurne, Postel, de Haan, Van der Palen, & DeJong, 2017; Wagner et al., 2016). Six studies poorly addressed blinding, with participants aware they were not receiving the e-therapy intervention, which conceivably would have impacted on study engagement. One study did however report face-to-face CBT was received after study-end, which may have improved acceptability, as treatment is ultimately received (Schmidt et al., 2008). All studies utilised evidenced-based content to some extent in their e-therapy programmes. CBT was the most prevalent psychological model used across seven studies (Hogdahl et al., 2016; Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, et al., 2011; Ter Huurne, De Haan, Poste, et al., 2015; Ter Huurne et al., 2017; Watson et al., 2016; Zerwas et al., 2016), followed by Cognitive Remediation Therapy (CRT) (Brockmeyer et al., 2014). Content ‘based on CBT’ (Nevonen, Mark, Levin, Lindström, & Paulson-Karlsson, 2006; Robinson & Serfaty, 2008; Schmidt et al., 2008; Wagner et al., 2016), and a combination of CBT and ACT (Strandskov et al., 2017) adequately addressed this e-therapy intervention content quality criteria.

Therapist support achieved a ‘well-covered’ quality rating for the majority of included studies, with 10/14 studies indicating regular support was provided throughout. Three studies achieved a lower quality rating as they offered ad hoc therapist support (Fernández-Aranda et al., 2009; Nevonen, Mark, Levin, Lindström, & Paulson-Karlsson, 2006; Strandskov et al., 2017), and one study ‘poorly addressed’ this quality criteria by lacking therapist contact during study involvement (Schmidt et al., 2008).

Half of all included studies clearly reported power calculations and scored well in terms of methodological quality as achieved a sample size sufficient for analyses. Four studies reported insufficient power and only adequately addressed this criteria (Hogdahl et al., 2016; Robinson & Serfaty, 2008; Ter Huurne, De Haan, Postel, et al., 2015; Ter Huurne et al., 2017). Three studies received ‘poorly addressed’ quality ratings as they did not appear to undertake power analysis (Brockmeyer et al., 2014; Fernández-Aranda et al., 2009; Nevonen, Mark, Levin, Lindström, & Paulson-Karlsson, 2006), however this could be a reporting error rather flaw in method.

Uptake, adherence and dropout rates

Uptake, adherence and dropout rates across studies were heterogeneous, and terminology varied across studies. The author reviewed reported data to derive uptake, adherence and dropout information where not explicitly provided.

Uptake: Of the three papers overall rated most methodologically strong, two indicated poorer uptake in delayed waitlist conditions compared to e-therapy, yet the differences were non-significant (Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, et al., 2011). Despite not achieving statistical group difference, these are potentially surprising findings as the underlying assumption for a delayed waitlist treatment is the implied acceptability, however here it appears to have negatively impacted on uptake rates. Conceptually, time of input is a factor that impacts on uptake for these two methodologically rigorous studies. A high uptake rate of 99% was conversely reported in the control group for another study (Brockmeyer et al., 2014), however these findings cannot be taken with equal value as this study was effected by assumed insufficient sample size or reporting error. An overall “failure to engage” rate of 16% was reported in two methodologically sound papers sharing the same data (Watson et al., 2016; Zerwas et al., 2016), however further detail on group split was not reported. Comparable rates of uptake for the intervention and control groups were found in one study (Schmidt et al., 2008), however this study was not as strong methodologically to other studies in this review, so although sufficiently powered the lack of blinding cannot be ruled out as a factor impacting on uptake to both groups. Overall an inconsistent pattern of uptake was noted across studies.

Table 2: Study data extracted across studies

Study	Groups (intervention / control)	Sample characteristics	Adherence/ completion attrition/dropout	Predictors of adherence/ completion, attrition/dropout
Nevonen et al (2006)	<ul style="list-style-type: none"> Internet-based SHG¹ (7 steps) for eating disorder patients, or 'normal control' receiving nil intervention 6 month duration Weekly therapist input (15+ minutes) – 'coach' 	<p><u>Diagnosis:</u> Bulimia Nervosa or EDNOS</p> <p><u>Sample size:</u> N= 38</p> <p><u>Sex:</u> All females</p> <p><u>Mean age:</u> 21.1yrs</p> <p>(NB. recruitment of 18-24yrs only)</p> <p><u>Mean duration of illness:</u> 5.1yrs</p>	<p><u>Adherence</u></p> <p>18% overall completion</p> <p><u>Time of drop-out</u></p> <p><u>Steps 1-3 (behavioural component):</u> 53% completed</p> <p><u>Steps 4-6 (cognitive component):</u> 29% completed</p>	<p><u>Therapist factors:</u> 1 coach generated 6 patients who completed all steps, 2 other coaches generated 1 completer.</p> <p>Failure to engage suggested to be effected by:</p> <ul style="list-style-type: none"> Seriously affected patient group (58% referred back into service following SHG completion) Limited impact of programme/order of modules Different approaches amongst coaches 'more therapeutic approach' (x1), more support)
Robinson & Serfaty (2008)	<ul style="list-style-type: none"> Treatment groups: Email bulimia therapy (eBT – 3 emails per week), self-directed writing (SDW, therapeutic writing, nil advice), or waitlist control (WLC). Comparison clinic sample 3 months 11 therapists provided eBT + email reminders weekly to promote engagement. SDW – minimal therapist contact 	<p>Randomisation stage:</p> <p><u>Diagnosis:</u> Bulimia Nervosa (purging or non-purging), Binge Eating Disorder, EDNOS ²</p> <p><u>Sample size:</u> N= 97 at randomisation (eBT=36, SDW= 34, WLC=27)</p> <p>Analysis stage:</p> <p><u>Sex:</u> 4 males (4.1%)</p> <p><u>Mean Age:</u> 24.5years</p> <p><u>Mean duration illness:</u> 7.3yrs</p> <p><u>Previous treatment :</u> 24%</p>	<p><u>Follow-up:</u></p> <p>63% (61/97) completed follow-up questionnaires.</p> <p><u>Drop-out:</u></p> <p>37% 'default rate' in total (eBT=47%, SDW=35%, WLC= 26%)</p> <p><u>Completers:</u></p> <p>19/34 (55.9%)= eBT</p> <p>22/34 (64.7%)= SDW</p> <p>20/27 (74%)= WLC</p>	<p><u>Acceptability of intervention:</u></p> <p>eBT: Helping to 'regain control' & anonymity (therapist not see patient in person). 23/43 (53.5%) would accept on-line therapy in the future. 60% positive comments about eBT.</p> <p><u>Gap between emails/response unhelpful</u></p> <p><u>Email therapy - concerns about breaches of security</u></p>

¹ Self-help guide

² Eating not otherwise specified

<p>Schmidt et al (2008)</p>	<ul style="list-style-type: none"> • CD-ROM or waitlist control (WLC) - 15 face-to-face sessions of CBT received following study-end • 8-12 weeks • No practitioner guidance/support, followed by flexible number of therapist sessions depending on clinical need 	<p><u>Randomisation stage:</u></p> <p><u>Diagnosis:</u> Bulimia Nervosa, EDNOS (bulimic type)</p> <p><u>Sample size:</u> N= 97</p> <p><u>Analysis stage:</u></p> <p><u>Sex:</u> 96.9% female (100%= CD-ROM, 91.7%= WLC)</p> <p><u>Mean Age:</u> 27.1 years (25.6yrs= CD-ROM, 28.7yrs= WLC)</p> <p><u>Mean duration of illness:</u> 8 years (6yrs= CD-ROM, 9.5yrs= WLC)</p>	<p><u>Uptake:</u></p> <p>65.3%= CD-ROM uptake 66.6%= therapist (WLC) uptake</p> <p><u>Follow-up assessments completed:</u></p> <p>3month: 83.7% CD-ROM, 83.3%WLC 7month: 61.2% CD-ROM, 62.5% WLC</p> <p><u>Attrition rate:</u> 38.1% from baseline to the 7-month follow-up</p> <p>[Drop-out mechanism explored - nil evidence of baseline variables predicting drop-out]</p>	<p><u>Remission of symptoms impact on adherence:</u></p> <p>5/8 (62.5%) in high-adherence group (4-8 sessions completed) and 11/ 33 (33%) in low-adherence group (0-4 sessions) demonstrated remission from bingeing/vomiting/laxative misuse at 3 months.</p> <p><u>Poor uptake potentially due to urban sample:</u></p> <p>Serves transient urban population, uptake influenced possibly by sample characteristics.</p> <p><u>Unrepresentative of eating disorder patients:</u></p> <p>Same service 35% original referrals never seen (50% entered treatment, 25% reached end of treatment (Welch & Fairburn, 1996).</p> <p><u>Long period awaiting intervention:</u></p> <p>Months between GP referral to specialist assessment. Further waiting for WLC, followed by wait for therapy due to lack of therapist availability. Impacting negatively on motivation for treatment/ willingness to cooperate.</p> <p><u>Inflexibility of access (CD-ROM in clinic only):</u></p> <p>Limited to clinic settings during working hours (one only part-time opening).</p> <p><u>Therapist support:</u> One-off encouragement from clinician (3-months) increased participation by 3-6.5 sessions. Therapist experience possibly influencing (McIntosh et al, 2005)</p>
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Fernandez-Aranda et al (2009)	<ul style="list-style-type: none"> Internet-based therapy (IBT) or waitlist for input but unclear if IBT 7 steps, 16wks Weekly messaging from coach, 2x face-to-face during therapy. 	<u>Diagnosis:</u> Bulimia Nervosa <u>Sample size:</u> N= 62 <u>Sex:</u> All females <u>Mean age:</u> 23.7 years <u>Mean duration illness:</u> 6 years	<u>Dropout rate</u> IBT 35.5% <u>Time of dropout</u> IBT: 25% in month 1, 7% month 2, 3% month 3.	No information collected on additional relevant predicting factors (e.g., frequency of contact with the coach).
Sanchez-Ortiz et al (2011a) Study 1 ----- Sanchez-Ortiz et al (2011b) Study 2	<ul style="list-style-type: none"> Internet-based cognitive-behavioural therapy (ICBT) with email support, or waitlist following by ICBT 3 months later (WL/DTC) 8x 45 minute sessions. Encouraged to complete over 8-12 weeks, but only access for 24 weeks. <p>Two cognitive-behavioural therapy-trained therapists (eating disorder experience) provided email support. Sent emails once every 1-2 weeks & responded to emails received. Therapist support 'tailed off' after 3 months.</p>	<u>Diagnosis:</u> Bulimia Nervosa or EDNOS. <u>Sample size:</u> N= 76 (iCBT=38, WL/DTC=38) <u>Study 2:</u> 71/76 received email support, 48% in DTC. 712 emails sent by therapists to patients <u>Sex:</u> 75 female, 1 male <u>Mean age:</u> 23.9yrs (iCBT=22.7yrs, WL/DTC= 25yrs) <u>Mean duration of illness:</u> 6.6yrs (iCBT=5.2yrs, WL/DTC= 8.3yrs) <u>Previous psychological eating disorder treatment:</u> 72%	<u>Adherence</u> <u>Started treatment:</u> iCBT: 78.9% WL/DTC: 65.8% <u>Completed 1 session at 3months:</u> iCBT: 30 participants WL/DTC: 25 participants <u>Of those, mean number of sessions completed:</u> iCBT: 5.5 sessions WL/DTC: 5.3 sessions <u>Completers (with email support)</u> 48% across both groups completed 4 or 4+ sessions (n=22 or 29% iCBT group, and n=15 or 20% DTC)	Study 1 <u>Time at which treatment is received:</u> Uptake of iCBT was (non-significantly) poorer in the WL/DTC group. Poorer outcomes in WL/DTC group highlight benefit of iCBT in providing immediate access to effective treatment. ----- Study 2 <u>Email content:</u> Supportive rather than cognitive-behavioural kept 93% engaged. <u>Barriers to uptake:</u> <ul style="list-style-type: none"> Email support lacks Socratic cognitive behavioural dialogue/guided discovery to promote behaviour change. Proposed face-to-face support sessions/telephone to improve alliance between therapist and patient. Qualitative feedback: blended approach with guidance would be appealing, intensify experience by adding face-to-face <u>Therapist factors</u> <ul style="list-style-type: none"> Skill as 'supportive' therapist, difficult to define <u>Acceptability of intervention:</u> Valued email support, crucial for motivation for continued programme use.

Brockmeyer et al (2014)	<ul style="list-style-type: none"> • Treatment as usual, plus Cognitive Remediation Therapy (CRT) or Non-specific neurocognitive Therapy (NNT), with computer-assisted sessions • 30x 45minute sessions (21 computer assisted, 9 face-to-face) delivered over a 3 week period • Participants received financial compensation for study participation • Therapist input during face-to-face sessions 	<p><u>Diagnosis:</u> Anorexia Nervosa</p> <p><u>Sample size:</u> N= 40 (20=CRT, 20=NNT)</p> <p><u>Sex:</u> N/R</p> <p><u>Mean age:</u> CRT= 23.6yrs, NNT=26.7yrs</p> <p><u>Mean duration of illness:</u> CRT=7.9yrs, NNT=6.9yrs</p>	<p><u>Dropout at group allocation:</u></p> <p>CRT=2, NNT=1 (discharged)</p> <p><u>Dropout at 1yr follow-up:</u></p> <p>Loss to follow-up due to patient discharge: CRT=2, NNT=2</p> <p>Discontinued intervention: CRT=2, NNT=0</p>	<p><u>Reasons for dropout:</u></p> <ul style="list-style-type: none"> • Transferral to a different site • Patient discharge <p><u>Possible reasons for treatment adherence:</u></p> <ul style="list-style-type: none"> • Well-matched training to participant problems in daily life (80% of CRT group, 57% of NNT group) • Acceptable programme (90% of CRT group, 86% of NNT group would recommend training to others) • Symptom improvement (gradually improved on training tasks over time)
Ter Huurne et al (2015) Study 1	<ul style="list-style-type: none"> • Web-based Cognitive Behavioural Therapy (Web-based CBT), Waitlist (WL) Control (supportive emails once every 2 weeks) • 20minutes daily via structured 2-part programme: 21 contact moments, 10 assignments. 3 month duration. • Personalised therapist contact twice weekly (via internet), consistent message format. Additional telephone contact if requested. • €10 online store digital voucher for each completed questionnaire, except for the baseline. Intervention covered by Dutch health insurance, some paid up to €350 participation. 	<p>Randomisation stage</p> <p><u>Diagnosis:</u> Bulimia Nervosa, Binge Eating Disorder, EDNOS</p> <p><u>Sample size:</u> N= 214 (Web-based CBT=108, WL Control group=106)</p> <p>95.8% (N=205) of all data appropriate for secondary analysis.)</p> <p><u>Sex:</u> All female</p> <p>Analysis stage</p> <p><u>Mean Age:</u> 39.4yrs</p> <p><u>Duration of illness:</u> >20yrs= 38%, 11-20yrs= 30%, 6-10yrs= 16%, 1-5yrs= 15%.</p> <p><u>Previous eating disorder treatment:</u> 44%</p>	<p><u>Completion</u></p> <p>Treatment completers of Web-based CBT= 72 participant (66.7%)</p> <p><u>Dropout</u></p> <p>Web-based CBT= 11 (10.2%)</p> <p>WL Control= 2 (1.9%)</p> <p>Within the Web-based CBT group, 99% of the treatment completers (71/72) and 56% of the treatment non-completers (20/36) completed the questions regarding treatment acceptability.</p>	<p>Study 1</p> <p>Individuals withdrawing from study were <u>more likely to live alone and have less self-esteem</u>, compared to post-assessment completers.</p> <p><u>Intervention:</u></p> <p>Rated as rather (46%) or very (35%) useful, especially effective for eating behaviour. Rated 7.6 out of 10.</p> <p><u>Therapist input:</u></p> <p>Therapist rated 8.1 out of 10. Online contact rated very pleasant (77%), personal (60%), safe (92%). Almost all participants evaluated therapist support as 'added value', one of most valuable/important treatment components. Some missed other forms of contact (face-to-face, telephone) a little (33%), quite a lot (5%) or very much (8%).</p>

<p>Ter Huurne et al (2017)</p> <p>Study 2</p>	<p><i>Same as above</i></p>	<p><i>Same as above</i></p>	<p>Reasons for treatment non-completion were given by 67% of the non-completers (24/36).</p> <p><u>Dropout:</u> 37.6% overall treatment dropout. 18.5% early dropout (before or during treatment part 1), 19.0% late dropout (after part 1 or during part 2)</p>	<p><u>Reasons for dropout:</u></p> <ul style="list-style-type: none"> • 33%= Personal reasons or problems (e.g. lack time, psychological problems, lack motivation) • 29%= Treatment content/protocol (e.g. eating diary annoying/time-consuming, assignments not supportive, not enough weight-loss attention) • 21%= Online method (e.g. lack of personal contact, open-ended) • 2 discharged by therapist (seriousness of problems). Intervention considered unsuitable for 1 by GP & Psychologist, referred to face-to-face treatment. <p>Study 2</p> <p>31 different reasons for dropout:</p> <p><u>Personal circumstances</u> = 52.8% (1/3 gave this as the only reason to stop)</p> <p><u>Treatment content/protocol</u> = 35.8%</p> <p><u>Online delivery</u>= 28.3% (not only reason for dropout)</p> <p><u>Other.</u> 34% reported multiple dropout reasons</p> <p><i>Early dropouts</i> – more often report reasons related to online delivery/start of another treatment.</p> <p><i>Late dropouts</i> – treatment content or protocol, plus other reasons.</p>
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Hogdahl et al (2016)	<ul style="list-style-type: none"> • BIB-ICBT/ Salut BN (both ICBT) • 6 steps/ 7 steps. Both 24wks • No incentives. Participants paid for 2x face-to-face meetings with therapist • Weekly, internet-based therapist support. 	<p><u>Diagnosis:</u> Bulimia Nervosa, EDNOS³, Binge Eating Disorder (and history of inappropriate compensatory behaviour within <1 year)</p> <p><u>Sample size:</u> N= 150 (109=ICBT,41=day programme)</p> <p><u>Sex:</u> 149 female, 1 male</p> <p><u>Mean age:</u> 27.1 yrs (completers), 27.5yrs (dropout)</p>	<p><u>Dropout rate</u></p> <p>35 (36%) dropouts (those terminating treatment prematurely)</p> <p><u>Completion</u></p> <p>63 (64%) completers (completed first treatment step, remained in treatment until mutually agreed symptom reduction)</p>	<p><u>Therapist factors:</u> Minority of people dropped out (29%, 30%, 30%) for 3 therapist, larger majority for 4th therapist (82%).</p> <p><u>Duration of illness:</u> On average, duration of illness was reportedly close to 3 years longer for dropouts than completers</p> <p><u>Personality:</u> Lower scores in Dutifulness & Assertiveness, and higher scores in the Self-affirm cluster predicted dropout.</p>
Wagner et al (2016)	<ul style="list-style-type: none"> • Internet-based, therapist-supported CBT or waitlist control (WLC) - started ICBT 16 weeks later • 16 week treatment • Therapist led – guided therapy with 'intensive therapist-input'. Participants could call/email if distressed or in crisis. 	<p><u>Diagnosis:</u> Binge Eating Disorder</p> <p><u>Sample size:</u> N= 139 (ICBT= 69, WLC=70)</p> <p><u>Sex:</u> 134 females, 5 males</p> <p><u>Mean age:</u> 35.1yrs (ICBT=34.9yrs, WL control= 35.3yrs)</p> <p><u>Mean duration of illness:</u> 26.6% previous psychotherapeutic treatment</p>	<p><u>Attrition rate:</u> 27% overall.</p> <p><u>Adherence to ICBT</u></p> <p>86% averaged 16weeks.</p> <p>71% completed all.</p> <p>73.9% completed +80%.</p> <p>89.9% completed +50%.</p> <p><u>Dropout time:</u> 7% at 3-5wks</p> <p><u>Dropout rate (pre – PTA)</u></p> <p>ICBT= 27.5%(n=19)</p> <p>WL control = 8.6% (n=6)</p> <p><u>Dropout rate (follow-up)</u></p> <p>28% completed PTA</p> <p><u>Time of dropout:</u></p> <p>PTA⁴ -3months: ICBT=4</p> <p>3-6months: ICBT=1</p> <p>6-12 months: ICBT=9</p>	<p><u>Dropouts more likely to have low level of education.</u></p> <p>No difference between ICBT/WL control clinical baseline characteristics (e.g. ED symptoms, depression/ anxiety)</p> <p><u>Reason for dropout:</u></p> <p>4 patients gave no reason (could not be reached)</p> <p>4 patients preferred face-to-face therapy</p> <p>3 internet-based therapy not appropriate approach for them.</p> <p>5 patients stopped for other reasons (e.g. lack of time)</p> <p>2 patients were excluded due to "unreliableness"</p>

³ Eating Disorder Not Otherwise Specified

⁴ Post-treatment assessment

<p>Zerwas et al (2016)</p> <p>Study 1</p> <p>-----</p> <p>Watson et al (2016)</p> <p>Study 2</p>	<ul style="list-style-type: none"> Online chat group (CBT4BN) or face-to-face group (CBTF2F) 16 sessions@ 90mins, 20wks duration Incentives: \$20 for post-treatment assessment completed, \$20 follow-up assessment completed Therapist led 	<p><u>Diagnosis:</u> Bulimia Nervosa</p> <p><u>Sample size:</u> N= 191 (randomisation) (CBT4BN= 95, CBTF2F= 96)</p> <p><u>Sex:</u> Female (98%), male (2%).</p> <p><u>Mean age:</u> 29yrs (CBT4BN), 28yrs (CBTF2F)</p> <p><u>Mean duration of illness:</u> 9.5years</p>	<p><u>Failure to engage</u>⁵</p> <p>16% overall (CBT4BN=12%, CBTF2F=21%)</p> <p><u>Dropout rate</u></p> <p>CBT4BN: 61% CBTF2F: 57%</p> <p><u>Completion</u></p> <p>74 completers 105 non-completers</p> <p>[NB. Contrary to expectations, CBT4BN did not reduce failure to engage or dropout compared to CBTF2F]</p>	<p><u>Completers</u> - Greater education (68%), lower BMI (23)</p> <p><u>Intervention type:</u> Online group inferior on treatment acceptability rating, treatment dropout & self-monitoring adherence compared to F2F group.</p> <p>-----</p> <p>Failure to engage predicted by:</p> <ul style="list-style-type: none"> Lower perceived treatment credibility Expectancy for treatment Higher BMI <p><u>Dropout predicted by:</u> less education, higher novelty seeking, prior experience of CBT, randomised to delivery format (not preferred)</p>
<p>Strandskov et al (2017)</p>	<ul style="list-style-type: none"> ACT-influenced Internet-based CBT (Treatment group) - Interactive content, immediate feedback. WLC group (received intervention ultimately) 8 modules over 8 weeks. Therapist assigned to participants. Immediate feedback or telephone input. Daily online therapist input. (8% received 1-5 calls each) 	<p><u>Diagnosis:</u> 39% Bulimia Nervosa, or 61% Eating Disorder Not Specified</p> <p><u>Sample size:</u> n=92 (treatment n= 46)</p> <p><u>Sex:</u> 96.7% female, 3.3% male (Treatment: 93.5% female, control: 100% female)</p> <p><u>Mean age:</u> 29.1yrs (29.4yrs=Treatment, 28.9yrs=Control)</p> <p><u>Mean duration of illness:</u> 13 years (12yrs=Treatment, 14yrs= Control)</p> <p><u>Previous input treatment:</u> 48.9% (39.1%= Treatment, 58.7%= Control)</p>	<p><u>Dropout rate:</u></p> <p>21.7% total (n=19) Treatment= 15 (32.6%) WL Control= 4 (8.7%)</p> <p><u>Time of dropout :</u> Module 1: n=6, Module: n=3, Module 3: n=1. Module 4: n=5.</p> <p><u>Study completers</u></p> <p>Treatment group: n=29 Control group: n=41</p>	<p><u>Reason for dropout:</u></p> <ul style="list-style-type: none"> Dropout from treatment group reportedly higher agoraphobia comorbidity (authors comment this could have been due to a sampling effect) Nature of online interventions (higher dropout than control) Short-terms intervention similar effects to longer-term CBT input without further effect. Implementing knowledge (psycho-education) could be key to behaviour change. Postulated therapist input aided adherence.

⁵ Failure to engage refers to attrition before treatment has started

Table 3: Methodological quality rating for included studies

<u>Study</u>	<u>Randomisation</u> Well-covered: Computer generated Adequately addressed: Randomised manually Poorly covered: Non-random approach/ no detail	<u>Blinding</u> Adequately addressed: Aware of group allocation, but all receive intervention Poorly covered: No blinding, incomplete/broken	<u>Intervention content quality</u> Well-covered: Evidence-based ED treatment leveraged Adequately addressed: “Based on” evidenced ED treatment	<u>Therapist contact</u> Well-covered: Regular or tailored Adequately addressed: Infrequent/variable Poorly covered: No therapist input	<u>Sample size</u> Well-covered: Power calculation defined. Sample size sufficient for all analysis Adequately addressed: Sample size sufficient for most analysis Poorly covered: Insufficient sample size	<u>Quality rating (/10)</u>
Brockmeyer et al, 2017	Well-covered	Poorly covered	Well-covered	Well-covered	Poorly covered	6
Fernandez-Aranda et al, 2009	Poorly covered	Poorly covered	Adequately addressed	Adequately addressed	Not addressed	2
Hogdahl et al, 2016	Well-covered	Well-covered	Well-covered	Well-covered	Adequately addressed	9
Nevonen et al, 2006	Adequately addressed	Poorly covered	Adequately addressed	Poorly covered	Not addressed	2
Robinson et al, 2008	Well-covered	Adequately addressed	Adequately addressed	Well-covered	Adequately addressed	7
Sanchez-Ortiz et al, 2011a	Well-covered	Adequately addressed	Well-covered	Well-covered	Well-covered	9
Sanchez-Ortiz et al, 2011b	Well-covered	Adequately addressed	Well-covered	Well-covered	Well-covered	9
Schmidt et al, 2008	Well-covered	Poorly covered	Adequately addressed	Poorly covered	Well-covered	5
Strandskov et al, 2017	Well-covered	Adequately addressed	Adequately addressed	Adequately addressed	Well-covered	7
Ter Huurne et al, 2015	Well-covered	Adequately addressed	Well-covered	Well-covered	Adequately addressed	8
Ter Huurne et al, 2017	Well-covered	Adequately addressed	Well-covered	Well-covered	Adequately addressed	8
Wagner et al, 2016	Well-covered	Adequately addressed	Adequately addressed	Well-covered	Well-covered	8
Watson et al, 2016	Well-covered	Poorly covered	Well-covered	Well-covered	Well-covered	8
Zerwas et al, 2016	Well-covered	Poorly covered	Well-covered	Well-covered	Well-covered	8

Completion/adherence rates: Overall completion rates in those studies with strongest methodological quality were between 48% (Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, et al., 2011) and 60% (Hogdahl et al., 2016). The highest overall completion of 86% was reported in a study with good methodological quality, interestingly where participants received intensive therapist guidance with an option to outreach by email or telephone if psychologically distressed (Wagner et al., 2016). Although we cannot assume therapist support is causally linked to enhanced study engagement, potentially the availability of experienced support could be a factor in maintaining adherence. Variable adherence rates to the intervention were observed across studies, ranging from 60-70% in three methodologically strong studies delivering ICBT (Ter Huurne, De Haan, Postel, et al., 2015; Ter Huurne et al., 2017; Wagner et al., 2016) to only 29% in two of the highest quality scoring studies that delivered ICBT (Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, et al., 2011). Control group completion rates of over 75% were comparably higher to e-therapy interventions for three studies (Nevonen et al., 2006b; Robinson & Serfaty, 2008; Strandkov et al., 2017), however these studies were less methodologically rigorous so caution is needed when generalising findings. Control group completion was less than the intervention group at 20% for two methodologically strong studies, so potentially this offers a more reliable indication of adherence rates (Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, et al., 2011).

Rates and time of dropout: Dropout rates were well-reported across included studies in this review, ranging from 22% to 38%. Highest rates were observed in the methodologically strongest studies (Hogdahl et al., 2016; Ter Huurne, De Haan, Postel, et al., 2015; Ter Huurne et al., 2017). Comparatively, the lowest dropout rate was for a recent study utilising ACT-influenced ICBT, with 22% overall attrition, and control dropout at 8.7% (Strandkov et al., 2017). Although scoring average overall in methodological quality, it was a sufficiently powered study with some therapist input and all participants ultimately received the treatment. Although interest is growing in mindfulness-based therapies like ACT in treating disordered eating (Masuda & Hill, 2013), research is relatively nascent using this psychological

theory in this population, which potentially had an impact on overall quality score. Although speculative, unique to this study is the tailored nature of input that utilised aspects of ACT and CBT models, which may have contributed to low dropout.

Time of dropout varied across all included studies, with methodologically rigorous studies reporting dropout as high later into study involvement (Ter Huurne, De Haan, Postel, & Palen, 2015; Ter Huurne, Postel, de Haan, Van der Palen, & DeJong, 2017; Wagner et al., 2016). Similarly, a study rated as less methodologically rigorous reported similar time of dropout, however the duration of e-therapy was over 6 months, one of the longest treatment durations which conceivably had an impact on dropout (Nevonen, Mark, Levin, Lindström, & Paulson-Karlsson, 2006). Time of dropout is not entirely comparable due to the heterogeneity of programme content and duration of study involvement, however there is utility in reporting available information to identify time of dropout patterns.

Predictors of uptake, adherence and dropout

Most included studies provided sufficient data to explore factors likely to impact on adherence and dropout, via narrative synthesis by the author of quantitative and qualitative data (summarised in Table 4).

Overleaf is a summary of predictive factors identified by papers achieving moderate to good methodological quality (overall quality rating 6+), in order to ensure interpretation is weighted by methodological quality. Caution implying any causal effect between predictive factors and subsequent adherence or dropout is noted, so subsequent comments are tentative in absence of rigorous statistical analysis.

Intervention-related factors: Delayed access to treatment was a key intervention-related factor identified by two of the methodologically strongest studies, specifically indicating improved outcomes and motivation for change for those with immediate e-therapy (Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, et al., 2011). Another paper similarly indicated the negative impact of treatment delay on motivation and willingness to cooperate (Schmidt et al., 2008). Acceptability was

a key intervention-related factor identified by two good quality papers as positively impacting on adherence, with 1/3 rating e-therapy as “very useful”, particularly at targeting eating behaviours (Ter Huurne, De Haan, Poste, et al., 2015; Ter Huurne et al., 2017). Another paper in support outlined 90% deemed e-therapy acceptable (Brockmeyer et al., 2014). Conversely, lower acceptability for online treatment compared to face-to-face was indicated by two papers, (Watson et al., 2016; Zerwas et al., 2016), suggesting that e-therapy is not preferable for all.

Table 4: Predictors of adherence and dropout across included studies

Predictors of adherence	
Brockmeyer et al (2017)	Intervention related: 90% deemed e-therapy acceptable. Well-matched daily issues. Participant/sample related: Continued to adhere if symptoms improved.
Hogdahl et al (2016)	Therapist-related: Positive therapeutic alliance.
Robinson et al (2008)	Intervention related: 60% positive comments on email therapy. 54% indicated accepting future online therapy.
Sanchez-Ortiz et al (2011a, 2011b)	Intervention related: Immediate input improved outcomes & motivation for change. 93% engagement connected to supportive emails.
Schmidt et al (2008)	Participant/sample related: 63% within the ‘high adherence group’ had symptom remission compared to 33% within the ‘low adherence group’. Therapist-related: Encouragement from therapist at 3 months increased participation from 3 to 6.5 sessions.
Ter Huurne et al (2015; 2017)	Intervention related: 1/3 rated “very useful”. Therapist-related: Therapeutic support added value to input.
Watson et al & Zerwas et al (2016)	Participant/sample related: Lower BMI and greater education.
Predictors of dropout	
Nevonen et al (2006)	Intervention related: Limited impact of the programme & module order. Participant/sample related: Symptom severity and illness duration with 58% re-referred into services.
Hogdahl et al (2016)	Participant/sample related: 3 years longer duration of illness if dropout. Personality factors such as lower in terms of dutifulness and assertiveness, but higher in self-affirmation.
Robinson et al (2008)	Intervention related: Email security concerns raised. Therapist-related: Poor responsiveness (gap between emails) was reportedly “unhelpful”.
Sanchez-Ortiz et al (2011a, 2011b)	Intervention related: Lacks Socratic CBT dialogue.
Schmidt et al (2008)	Intervention related: Delay in treatment negatively impacted on motivation for treatment/willingness. Limitation of access in clinic only. Participant/sample related: Transient, urban sample.
Ter Huurne et al (2015; 2017)	Intervention related: Treatment content or protocol dropout reason. 21% rated not preferred treatment option. Participant/sample related: Discharged from therapy as improved symptoms. 33% stated ‘personal reasons’ for dropout. More likely to live alone and have less self-esteem.
Wagner et al (2016)	Intervention related: Prefer face-to-face input over e-therapy. Participant/sample related: Lack of time or “unreliable”. Lower education-level.
Watson et al (2016) & Zerwas et al (2016)	Intervention related: Online group rated inferior treatment. Participant/sample related: Lower perceived treatment credibility. High BMI & lower education. Prior experience of CBT, higher novelty-seeking and not receiving preferred treatment were implied in “dropouts”.

Regarding content, two studies achieving good overall methodological quality reported supportive emails kept 93% engaged in e-therapy, with email support being crucial for continued programme use (Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, et al., 2011). Another study reported e-therapy well-matched problems in daily life, maintaining adherence (Brockmeyer et al., 2014). Participants in two studies, however, reported 29% found treatment content/protocol their dropout reason (Ter Huurne, De Haan, Poste, et al., 2015; Ter Huurne et al., 2017), indicating that personal preference may influence engagement with programme content. Relating also to content, another study questioned the impact of certain types of content, suggesting psycho-educational content may not influence behaviour change (Strandskov et al., 2017). This highlights the need for further evaluation of content that best promotes engagement and subsequent behaviour change.

A concern for two studies was that email platforms lack Socratic CBT dialogues (Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, et al., 2011), and another of moderate quality study indicated e-therapy offered solely in a clinic setting was a limitation (Schmidt et al., 2008). Method of delivery accounted for 21% of dropout in two studies, (Ter Huurne, De Haan, Poste, et al., 2015; Ter Huurne et al., 2017), with another good quality study highlighting some prefer face-to-face therapy (Wagner et al., 2016). Concerns relating to email security were raised by some subjects, which plausibly impacts on uptake (Robinson & Serfaty, 2008).

Participant and sample-related factors: Personality factors were suggested to impact on dropout, with one methodologically rigorous study demonstrating study dropouts scored lower in dutifulness and assertiveness, but higher in self-affirmation (Hogdahl, Levallius, Bjorck, Norring, & Birgegard, 2016). Those at increased risk of dropout were more likely to live alone and have less self-esteem (Ter Huurne, De Haan, Poste, et al., 2015; Ter Huurne et al., 2017). Lower BMI and greater education was observed in those completing one study (Zerwas et al., 2016), supported by another study indicating study dropouts had a lower education level compared to completers (Wagner et al., 2016). Lower perceived treatment credibility, prior

experience of CBT, higher novelty-seeking and not receiving preferred treatment were implied in “dropouts” (Watson et al., 2016). Symptom improvement was positively associated with adherence, with one study identifying 63% of “high-adherence group” demonstrated symptom remission, compared to 33% (Schmidt et al., 2008). Duration of illness was a key factor highlighted by one of the methodologically strongest papers, with illness duration 3 years longer for those dropping out (Hogdahl et al., 2016). From qualitative feedback, two good quality studies reported 33% had personal reasons for dropout (Ter Huurne, De Haan, Poste, et al., 2015; Ter Huurne et al., 2017) but others studies indicating “lack of time and “unreliableness” (Wagner et al., 2016). One study suggested dropout may be connected to the transient, urban sample (Schmidt et al., 2008), however this was speculative in nature rather than a causal relationship investigated.

Therapist input: An important factor identified as impacting on ongoing engagement is the nature of therapist input, with a key study connecting a positive therapeutic alliance and ongoing adherence (Hogdahl et al., 2016). Therapist input reportedly “added value” for some participants (Ter Huurne, De Haan, Poste, et al., 2015; Ter Huurne et al., 2017), and therapist encouragement at three months increasing participation from 3 to 6.5 sessions (Schmidt et al., 2008). Therapist responsiveness was highlighted by one study of moderate quality as impacting on dropout, specifically the gap between emails was deemed “unhelpful” (Robinson & Serfaty, 2008).

Discussion

Findings

This review explored factors regarding adherence and dropout from e-therapy in randomised controlled trials (RCTs), which are affected by non-compliance and missing data (Gupta, 2011) and therefore pertinent to this review. Included studies demonstrated variation in overall completion rates (18-86%) and dropout rates (22%-38%). Within e-therapy, completion rates were 50-71% and dropout 22-61%, which is consistent with the wider literature regarding e-therapy completion (Christensen et al., 2009; Hötzel et al., 2014; Aardoom, Dingemans, Spinhoven, & Van Furth, 2013;

Fassino et al., 2009) and eating disorders specifically (Schlegl, Bürger, Schmidt, Herbst, & Voderholzer, 2015). Emerging from review findings it is clear that heterogeneity exists across e-therapy, yet aside from programme variety, at the core of all programmes reviewed are evidenced-based therapies (CBT, CRT, ACT). Inconsistencies in time of dropout were identified across papers, with good quality papers indicating dropout at latter timepoints, and others indicating high dropout early in e-therapy. Predictors of adherence and dropout from e-therapy were collated as intervention-related, participant and sample-related, and therapist-related factors, and explored in the context of wider e-therapy literature below.

Wider implications of findings and conceptual issues

Treatment delay appeared to negatively impacted on motivation and willingness to engage (Schmidt et al., 2008), with better outcomes and motivation indicated for those receiving immediate input (Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, et al., 2011). Considering this in the wider context of appropriate stage of input, although it appeared in these studies that immediacy of treatment is advised, an array of individual characteristics are likely to influence appropriate time of input. Recent research indicates although ICBT for ED has been shown to be effective at different stages of the patient journey, as standalone, adjunct to face-to-face input, or as part of stepped care ED treatment, personalisation to an individual's needs is crucial (Aardoom, Dingemans, Fokkema, Spinhoven, & Van Furth, 2017). Acceptability of e-therapy was another key intervention-related factor appearing to impact on adherence, however variability was observed with some finding it a useful treatment option (Brockmeyer et al., 2014; Ter Huurne, De Haan, Postel, et al., 2015; Ter Huurne et al., 2017), and others reporting low acceptability, instead preferring face-to-face input (Watson et al., 2016; Zerwas et al., 2016). Within the wider e-mental health research base, a study exploring treatment preferences found that despite 77% preferring face-to-face input, only 10% indicated they would not use e-health services (Klein & Cook, 2010). Although not within ED populations, broadly-speaking these findings give support towards e-therapy as an acceptable treatment modality, influenced by personal preference. Programme content was the third, key intervention-related factor identified in this review, with

email support (Sánchez-Ortiz, Munro, Stahl, et al., 2011; Sánchez-Ortiz, Munro, Startup, et al., 2011) and effective treatment of daily problems (Brockmeyer et al., 2014) promoting adherence. Poor content was indicated as a reason for dropout in two studies (Ter Huurne, De Haan, Postel, et al., 2015; Ter Huurne et al., 2017), however detail on the specific aspects of content deemed unhelpful were not indicated. A wider conceptual challenge is determining which aspects of content encourage engagement and nurture behaviour change, which was highlighted in one study in this review suggesting that psycho-educational content is unlikely to promote behaviour change (Strandskov et al., 2017). Although not directly linked to adherence and dropout per se, this connects to the wider issue of e-therapy effectiveness. Health locus of control (HLOC) is a key factor identified broadly in e-therapy research as impacting on behaviour change (Klein & Cook, 2010). In one study, e-therapy ‘preferers’ demonstrated high ‘chance’ LOC, perceiving chance factors determine their mental health (Wallston, Stein, & Smith, 1994), and scored low on ‘doctors’ LOC, specifically the perception doctors or professionals influence their mental health (Klein & Cook, 2010; Wallston et al., 1994). In light of this, consideration of patient HLOC warrants further exploration within ED research, particularly as plausibly adherence to e-therapy may be influenced by an individual’s perception of factors that influence their own mental health status.

Personality and sample characteristics were indicated as factors impacting on adherence and dropout, with completers more likely to have low BMI, be more educated (Wagner et al., 2016) and observe improvement in symptoms during study involvement (Schmidt et al., 2008), compared to those who dropout who reportedly have more chronic eating disorders (Hogdahl et al., 2016), low self-esteem and live alone (Watson et al., 2016). From this, it could be assumed that e-therapy perhaps has an ‘ideal’ target population in terms of personality-type, symptom severity and chronicity that warrants further investigation. Utilising evidence from the anxiety and depression e-therapy literature, further consideration of disease-related factors is required, as these in turn impact on treatment uptake and maintenance (Christensen, Griffiths, & Farrer, 2009). For example, the cognitive/emotional characteristics of depression are indicated to impact on an individual’s treatment choice, uptake and

adherence to e-therapy, implying the need for tailored interventions using different modalities (Christensen et al., 2009), and conceivably eating disorder characteristics will impact on how someone engages or not in e-therapy.

Positive therapeutic alliance (Hogdahl et al., 2016), perceived added value of therapist contact (Ter Huurne, De Haan, Postel, et al., 2015; Ter Huurne et al., 2017), regularity of input (Robinson & Serfaty, 2008) and encouragement (Schmidt et al., 2008) were all therapist-related factors indicated across studies to positively impact on adherence and dropout. This is supported by evidence that personalised guidance, particularly from a therapist (Apolinário-hagen, Kemper, & Stürmer, 2017), improves completion and adherence to internet interventions (Beintner, Jacobi, & Taylor, 2014). Referring to the guided self-help literature more broadly, those who appear low in motivation can be kept engaged with supportive guidance (Gellatly et al., 2007).

Future research directions

E-therapy has an increased presence in the recently launched Mental Health Strategy 2017-2027 (The Scottish Government, 2017), with national CCBT roll-out with NHS-24 and the development of a digital tool for young people with eating disorders two key actions emerging. Considering this political climate for e-therapy for ED, there is an opportunity to propose future research in this field. Exploration of the extent of symptom improvement using a session-by-session approach would facilitate identification of optimal treatment length (Strandskov et al., 2017). Further studies comparing e-therapy degree of therapist support would be useful to identify whom this modality best suits in terms of their ED, symptom severity and HLOC (Aardoom et al., 2017; Klein & Cook, 2010). As therapist input alongside e-therapy was identified as supporting adherence, exploration using qualitative methods of the nature of therapist input required to sustain motivation and ongoing engagement of participants would be useful, in order to gain a deeper understanding of what makes an effective therapist alongside e-therapy, to inform matching of therapist to individual to nurture a strong therapeutic alliance alongside e-therapy. Adapting e-therapy interventions to be flexible in structure would allow for a more personalised

approach, whereby therapists can guide participants between programme steps (Nevonen, Mark, Levin, Lindström, & Paulson-Karlsson, 2006a).

“Blended” approaches, combining e-therapy with face-to-face interventions are gaining momentum enabling optimal benefit from both treatment modalities (Wentzel, Vaart, Bohlmeijer, & Gemert-Pijnen, 2016), however blended treatments are less prevalent in ED research. Future studies could focus on blended ED approaches, exploring effective content indicated by symptom improvement and patient acceptability, as is indicated from other populations where blended approaches were preferred by patients (Van Der Vaart, 2014). For future RCTs of e-therapy for eating disorders, acceptable comparator conditions need to be utilised, matching the intervention in format and delivery-length, as a lack of participant masking contributes to dropout. Reviewing the adherence literature, there is still a paucity of evidence regarding specific component factors that improve adherence (Donkin et al., 2011), and a qualitative exploration of participant and clinician perspectives of e-therapy for eating disorders would be useful to explore their views on practical aspects of programmes (e.g. content, duration), but also to gain a better understanding of what influences their willingness and motivation to engage, in order to inform future e-therapy programme development.

Strengths and limitations of review

Overall the review was as inclusive across ED diagnoses, e-therapy with varying content/duration, enabling a comprehensive, up-to-date overview of the evidence. Subjective bias was minimised through the independent rating of study methodological quality, producing good inter-rated reliability as recommended in previous reviews (Coull & Morris, 2011). The inclusion criteria limited this review to RCT studies only for two main reasons: firstly this method is generally accepted as the “gold-standard” in clinical research (Medical Research Council, 2008), and secondly using a control comparator allows monitoring of engagement to the intervention. Recent research however highlighted caution when assuming the RCT as the only “gold standard” method, instead encouraging researchers to consider the most appropriate methods relevant to that population of interest, informed by

background knowledge (Cartwright, 2007). Consequently as this review focussed only RCTs, patient preference and feasibility studies were not captured. Utilising less stringent inclusion criteria to include other methods such as cohort studies that allow patient preference would be useful, especially when intervention effectiveness is not being explored. Additionally, included studies scarcely masked participants to group allocation and a few studies lacked randomisation, either using opportunity sampling (consecutive referrals) or poor randomisation methods so therefore lacked RCT characteristics. Methodologically this review followed CRD guidance for undertaking systematic reviews, a source of good practice according to the National Institute for Health Research Health Technology Assessment (NIHR HTA) and National Institute for Health and Clinical Excellence (NICE)(Centre for Reviews and Dissemination, 2009). In addition, the author undertook a narrative synthesis of data and did not solely rely on reported factors, which was particularly strength.

Heterogeneity in e-therapy programmes is present in other populations (Donkin et al., 2011), and similarly was observed across e-therapy programmes in this review. Subsequently, a meta-analysis was not possible and therefore this is a limitation of this review, but also wider e-therapy evidence-base with heterogeneous programmes. Another limitation is that individuals with sub-threshold symptoms were excluded from this review, however this was rationalised as prevention/relapse prevention was outside the scope of this review, which was instead focussed on exploring diagnosable eating disorders using e-therapy. All eating disorder diagnoses were included in this review, which although inclusive, was a limitation as despite sharing similar traits they are not a homogenous group, with online interventions reportedly more effective for certain groups than others (Fassino et al., 2009). Most studies in this review did not match known prevalence figures for males with eating disorders, and therefore caution is needed when generalising findings to males in light of limited evidence regarding their uptake, adherence and dropout. Finally, translation facilities were not feasible for this review, and therefore it is acknowledged that including English language studies only will limit generalisability and may be culturally biased.

Conclusions

Across all factors identified in this review as predicting adherence and dropout, individual differences (personality, disease status, treatment history) and personal treatment preferences are two key overarching factors broadly impacting on whether someone engages or not in e-therapy for ED. For some, e-therapy offers an acceptable standalone treatment option and for others they report preferring face-to-face treatment only. In light of these findings, flexibility of treatment options on offer is crucial in supporting individuals with varying levels of motivation and HLOC perception, in order to maximise adherence and minimise dropout. Future research directions should use rigorous methods to sensitively measure symptom improvement connected to modules of programme content, exploring also optimal therapist input (frequency, nature of support) to maximise therapeutic alliance. As a relatively nascent area of research, blended ED treatments should be tested to identify whether they improve ED symptoms and whether this is deemed an acceptable treatment option for patients.

Conflict of interest declaration

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Chapter 3: Empirical Project

A retrospective case series investigation of blended internet-based cognitive-behavioural therapy (ICBT) and face-to-face cognitive-behavioural therapy (CBT) in the treatment of adults with eating disorders

Written in accordance with guidelines by Clinical Psychology & Psychotherapy
(Appendix E)

Keywords:

ICBT, eating disorders, case series, symptom improvement, quality of life, motivation, multi-level modelling

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Empirical Project Abstract

Background

Internet-based Cognitive Behavioural Therapy (ICBT) has a mature evidence-base across populations, with ICBT for eating disorders (ED) emerging also. ‘Blended’ ICBT and face-to-face input tentatively implies benefits of both treatments, but further research is needed. The aim was to explore in-depth individual symptom change when receiving blended ICBT and face-to-face ED treatment.

Methods

The retrospective case series explored change in ED, anxiety, depression, quality of life (QoL), motivation for change, overall psychological functioning and improvement, using standardised measures. Acceptability was tentatively explored using open-feedback.

Results

T-tests, multi-level modelling and visual analysis were completed, yet study findings were inconclusive regarding symptom change attributable to blended input. ED symptom severity as a predictor of overall psychological functioning and patient-rated improvement were related, yet findings were non-significant (possibly due to limited sample size).

Conclusions

Further research is required into factors predicting ED blended treatment outcome. Modernisation of ICBT packages is also recommended.

Introduction

Technology-assisted mental healthcare

An increase in the availability of effective, technology-assisted mental health treatments appears to be changing the way individuals access healthcare. The Mental Health Care Innovation Network have indicated that digital technology such as computers, internet, and mobile devices are being used to disseminate empirically supported interventions (Fairburn & Patel, 2017). As the availability of the internet and mobile-device platforms increases, this upward trend is predicted to continue (Loucas et al., 2014). One key advantage of using such platforms is the flexibility, perceived privacy, and relative anonymity that they offer. It has been suggested that this reduces shame and stigma associated with face-to-face mental health treatment, allowing individuals to progress through therapy at their own pace, and setting their own parameters for self-disclosure (Speyer & Zack, 2002). Technology-assisted interventions, also known as “e-therapy”, have demonstrated effective prevention and treatment of various mental health disorders (The Scottish Government, 2015), including individuals with anxiety and depression (Kenardy, McCafferty, & Rosa, 2003; Spek et al., 2007), panic disorder (Carlbring et al., 2006), and eating disorders (ED) (Leung, Ma, & Russell, 2013). Specifically within the ED population, technology-assisted interventions appear to show promise for reducing ED psychopathology, and improving quality of life and motivation for change (Leung, Ma, & Russell, 2012; Smink, Van Hoeken, & Hoek, 2012). Moreover, they provide an opportunity to nurture contact with individuals who may not have access to speciality ED care.

Theoretical underpinnings of internet-delivered cognitive-behavioural therapy (ICBT) and computerised cognitive-behavioural therapy (CCBT)

A mature evidence-base exists for internet delivered cognitive behavioural therapy (ICBT) and computerised cognitive behavioural therapies (CCBT) in individuals with anxiety and depression, with programmes such as ‘MoodGym’ (H. Christensen, 2004) and ‘Beating the Blues’ (NICE, 2010). Both programmes are well evidenced

in treating symptoms, with the latter deemed to be cost-effective (NICE, 2013). These programmes draw on evidenced psychological models underpinning face-to-face therapies – in this case, cognitive behavioural therapy (CBT). CBT is a structured, goal-orientated and collaborative therapy, exploring connections between an individual's thinking, emotions, physiology and behaviour (SIGN, 2010). It is based on behavioural and cognitive psychology principles; specifically, it assumes that the development and maintenance of mental health disorders is underpinned by maladaptive behaviours and thought distortions (Field, Beeson, & Jones, 2015). CBT therefore aims to reduce dysfunctional emotions and behaviours through behaviour modification, and by challenging and altering an individual's appraisals and distorted thinking patterns (NICE, 2014). CBT-based programmes are therefore appropriate for treating diagnoses that have cognitive distortions and maladaptive behaviours at the core of their presentation.

In the context of ED, the over-evaluation of shape and weight, and associated behaviours (bingeing, laxative use, over-exercise), are the core distortions and maladaptive behaviours targeted in CBT (C. G Fairburn, 2008). Evidence suggests that CBT is an effective, transdiagnostic ED treatment (Hay, Bacaltchuk, Claudino, Ben-Tovim, & Yong, 2003; Hay, Bacaltchuk, Stefano, & Kashyap, 2009, Porta, 2008). Within the ED population, ICBT appears to have a larger evidence-base compared to CCBT, with many studies in America and across Europe finding that ICBT can be effective in preventing and treating ED (Aardoom, Dingemans, Fokkema, Spinhoven, & Van Furth, 2017). For example, the ICBT prevention programme 'Student Bodies' has demonstrated an ability to reduce risk factors for the development of ED, (Agras, Fitzsimmons-Craft, & Wilfley, 2017; Beintner, Jacobi, & Taylor, 2012, 2014; Dev, Winzelberg, Celio, & Taylor, 1999; Loucas et al., 2014), while the 'Smart Eating' ICBT programme targets those with ED psychopathology (Leung, Ma, et al., 2012), improving quality of life and motivation for change (Leung, Ma, & Russell, 2013; Leung, Ma, & Russell, 2013). In terms of content, ICBT ED programmes typically involve psycho-education materials, cognitive restructuring and behaviour modification, with varying therapist support (Aardoom, Dingemans, Spinhoven, & Van Furth, 2013), sometimes with an

additional family/supporters component (Leung, Ma, et al., 2012). Such programmes are evidenced for preventing or treating ED symptoms, and promoting recovery (Aardoom et al., 2013; Leung, Ma, et al., 2013).

Blended treatment options

Researchers exploring the most appropriate stage of the treatment journey for ICBT have found that it is effective when used as a standalone option, a waitlist comparison, and as an adjunct to clinician-led therapy (also known as ‘blended care’) (Wentzel, Vaart, Bohlmeijer, & Gemert-Pijnen, 2016). A single definition of ‘blended care’ is lacking from researchers because the concept is operationalised in different ways; however, it has been described as “technology-supported care” within the extant literature (Wentzel et al., 2016). Conceptually, blended ED treatment could enable individuals to benefit from both ICBT and face-to-face treatment modalities, yet there has been a lack of well-designed studies exploring this (Aardoom, Dingemans, & Van Furth, 2016). With increasing demands on specialist mental health services to treat patients quickly, effectively, and at low cost in the community, utilising existing effective ICBT programmes like ‘Smart Eating’ (Leung, Ma, et al., 2012) alongside specialist ED treatment is worthy of further exploration. ‘Smart Eating’ draws on CBT, providing psycho-educational resources and CBT strategies to treat individuals with ED (Leung, Ma, & Russell, 2012). This programme consists of six components: promoting healthy eating, family education, health assessment, motivational enhancement, self-help strategies, and psychological health promotion (see Table 1 in Methods for further information).

Research into ICBT combined with specialist treatment in routine care is beginning to emerge (Wentzel et al., 2016), however, it is lacking within the ED population, particularly in the UK. An exploration of ‘Smart Eating’ ICBT blended with face-to-face CBT was therefore deemed clinically relevant, in an aim to address this gap in the literature. This ICBT programme was chosen as it has been demonstrated to be effective in treating ED symptoms in other countries (Leung, Ma, et al., 2012); however, there was uncertainty as to whether the programme would be effective and acceptable to patients within the UK.

Study aims and hypotheses

This study used a retrospective case series approach to explore ED patients' symptom changes whilst receiving blended ICBT ('Smart Eating') and face-to-face CBT treatment from TEDS over a twelve month period. Combining these two evidence-based CBT interventions into a blended treatment was postulated to impact on symptomatology to reduce ED severity and improve overall global functioning over treatment course. A case series was deemed the most appropriate approach as it demonstrates utility in refining new techniques and treatment protocols prior to advanced trials (Bhandari & Chan, 2011). The study hypotheses are as follows:

- a) Blended ICBT and face-to-face CBT will be associated with a reduction in severity of ED, anxiety and depression symptoms for cases over the course of treatment.
- b) Blended ICBT and face-to-face CBT will be associated with an improvement in cases quality of life, motivation for change and overall psychological functioning across the course of treatment.
- c) Blended ICBT and face-to-face CBT will be associated with improvements in clinician-rated and patient-rated symptom improvement across the course of treatment.

These hypotheses were investigated by exploring ED patients' symptoms pre and post blended intervention, through the comparison of mean scores using t-tests. Additionally, these hypotheses were also sought to be investigated through fitting multilevel models (MLM) to determine whether participant symptom scores changed over time, specifically whether global functioning scores (GAF) and patient-rated improvement ratings (PGI-I) increased over time. Considering also whether GAF and PGI-I were predicted by symptom severity (indicated by ED symptom scores, body mass index – BMI), and clinician-rated severity.

Within MLM, the first model ("Unconditional Model") aimed to establish whether sufficient variance exists to continue with further models. The second "Unconditional Linear Growth Model" aimed to explore whether patients experience

symptom change over time. The third “Unconditional Linear Growth Model with slope variation” aimed to explore whether patients experience change over time differently to one another, and the fourth “Modelling Within-Subjects Variance Model” explored the likely auto-regressive nature of data. Models 5 to 7 aimed to use these baseline models (models 1 to 4) to explore whether adding in separate predictor variables (Model 5: EDE-Q Global Score, Model 6: BMI, Model 7: CGI-S) as indicators of ED symptomatology accounted for any further variance in the model and improved model fit. Finally, acceptability of blended CBT as a treatment modality was also explored via open feedback from cases who received such input.

Methods

Design

A case series is defined by the Dictionary of Epidemiology as “*a collection of patients with common characteristics used to describe some clinical, pathophysiological, or operational aspect of a disease, treatment, exposure, or diagnostic procedure*” (Porta, 2008). Case series are useful in the exploration of estimates of relative incidence, controlling for fixed confounders, allowing for age or temporal variation and demonstrating high efficiency when compared to retrospective cohort studies (Musonda, 2006; Whitaker, Farrington, Spiessens, & Musonda, 2006). Facilitating the acquisition of ‘context-dependent knowledge’, closely connected to therapy delivered (Widdowson, 2011), case series offer a pragmatic and practice-orientated form of psychotherapy research (Fishman, 2005). Cases were selected retrospectively, with longitudinal symptom change explored via in-depth routine clinical data collected within the specialist ED service. This approach was deemed most appropriate considering the emerging research base of blended ICBT and face-to-face CBT for ED patients. In order to seek further clarification on associations between blended ED treatment and symptomatology, there were no constraints on participant characteristics, specifically regarding ED diagnosis, gender or age of cases (see Inclusion/exclusion criteria for more in-depth criteria). Case series are most appropriate for over 4 patients, whereas programmes with fewer patients should be described as individual case reports (Abu-Zidan, Abbas, & Hefny, 2012; Carlbring et al., 2006). For the purposes of this study, a

convenience sample size of eight was identified, with all cases actively engaging in blended ICBT and specialist ED treatment between August 2016 and August 2017.

Blended intervention setting

TEDS Service: Cases were patients under the care of TEDS, a specialist ED service providing assessment and treatments to adults over 18 years with a severe or enduring ED. The service treats individuals with Anorexia Nervosa (AN), Bulimia Nervosa (BN), Binge Eating Disorder (BED), atypical presentations (including Other Specified Feeding or Eating Disorder - OSFED, and Unspecified Feeding or Eating Disorder – UFED), as well as sub-threshold disordered eating. Usual treatment from TEDS involves a combination of medical care, nutritional rehabilitation and psychological therapy, most commonly CBT. Prior to recruitment, the Chief Investigator (CI) briefed all clinicians about the purpose of the study, details of the blended intervention of ‘Smart Eating’ and face-to-face CBT, and the inclusion/exclusion criteria for participant involvement.

The ‘Smart Eating’ ICBT programme: As detailed previously, ‘Smart Eating’ is a programme designed to target adults with ED (core programme components are summarised in Table 1). It was developed in the Asia-Pacific region and has shown promise at improving individuals eating psychopathology, motivation for change and quality of life (Leung, Ma, et al., 2012). Automatic feedback is provided via the ‘Health Assessments’ component so individuals can monitor progress. Participants set their own username and password when registering for the programme, and they can access content from a location of their choice whenever they wish. The ‘Family Education’ component provides materials to help family/partners/friends in their support of people with ED, with content derived from clinical experience and research evidence (Carlbring et al., 2006).

Inclusion/exclusion criteria

All TEDS patients were eligible for study involvement if they were aged 16-65 years old, met formal diagnostic criteria for an ED, and were currently receiving CBT from TEDS. Eligible participants were required to be fluent in English, have access to a

computer and to be English-literate to the extent of understanding self-report questionnaires and following verbal instructions. They were required to provide written consent for participation (see Appendices H & I). Individuals presenting with active suicidal intent, or individuals deemed too emotionally or physically frail to participate by TEDS clinicians, were not approached for study involvement.

Outcome Measures

‘Smart Eating’ health assessment measures:

The *Eating Disorders Examination Questionnaire* (EDE-Q) (Fairburn & Beglin, 1994) is a self-report questionnaire developed from the Eating Disorders Examination, investigator-based interview (Fairburn & Cooper, 1993). It assesses ED attitudes and behaviours as well as, more broadly, psychopathology associated with ED. The questionnaire explores behaviour frequency indicative of an ED over the preceding 28-days. The 28-items are scored on a 7-point scale from 0-6 (0 = not engaged in behaviour, 6= engaged in the behaviour daily), and mean scores are calculated to provide four subscale scores (Restraint, Eating Concern, Shape Concern and Weight Concern) and an overall EDE-Q Global score. The clinically significant cut-off for mean score is 4. The EDE-Q is psychometrically sound, reporting good internal consistency (Cronbach's $\alpha = 0.78-0.92$) and test-retest reliability (Pearson's $r = 0.81-0.94$) across the four subscales (Luce & Crowther, 1999).

Table 1: Summary of content within SE programme components

Component	Content
Healthy Eating <i>Psycho-education</i>	<ul style="list-style-type: none"> • Information on healthy diet ('Eatwell Guide') and ED warning signs • Healthy eating tips: food groups, regular intervals, fluid intake • Dietary assessment: monitoring of daily servings across food groups • Daily energy needs: recommended calories, activity level • Weight management: healthy BMI, weight loss misconceptions • Self-help strategies, information regarding when helpful/unhelpful
Family Education <i>Psycho-education</i>	<ul style="list-style-type: none"> • Information about ED: risk factors, diagnoses, co-morbidities • Message board to connect with other supporters
Health Assessment <i>Measures</i>	<ul style="list-style-type: none"> • Eating disorder symptoms: EDE-Q & EDI-3 • Anxiety and depression: BDI-II & BAI • Quality of Life: SF-36 • Motivation for Change: MSCARED
Motivational Enhancement <i>Psycho-education</i> <i>Therapeutic content</i>	<ul style="list-style-type: none"> • Information on motivational stages of change • Benefits and costs of change (worksheet). • Future-looking with or without an ED, future goals (worksheet). • Letter writing to ED as friend/enemy, anticipated difficulties when make changes (worksheet). • Motivated/confident/ready for change (worksheet). • Outline plan for change: steps for change, reasons for change, supporters available to provide input (worksheet).
Self-help Strategies <i>Therapeutic content</i> <i>Homework tasks</i>	<ul style="list-style-type: none"> • Introduction to self-help strategies: information on aim of strategies, evidence base for treatment, engaging supporters. • Step 1: Food diary to monitor intake & weekly weighing. • Step 2: Guide to regular eating patterns, commencing regular eating plan, ceasing maladaptive behaviours. • Step 3a/b: Challenging negative automatic thoughts, identification of unhelpful thinking and labelling, adapting behavioural strategies, prompt card to manage urges. • Step 4a: Step-wise weight control & living with a healthy weight. • Step 4b: Problem-solving strategy steps & review of progress. • Step 5: Tackling avoidance & restriction. • Step 6: Relapse prevention strategies.
Psychological Health Promotion <i>Psycho-education</i> <i>Therapeutic content</i>	<ul style="list-style-type: none"> • Strategies to improve body image: relaxation strategies, body-image desensitisation exercises, paper & pencil exercises • Managing anxiety: information on physiological symptoms, anxiety management strategies including relaxation, challenging cognitive distortions and alternative thoughts. • Coping with stress: Reappraisal of stressful event, mindfulness-based stress reduction strategies including mindfulness of breath, meditation, body scan, yoga exercises. • Overcoming depression: information on depression symptoms, behavioural activation strategies, cognitive distortions and balancing with alternative thoughts. • Boosting self-esteem: strategies to boost self-esteem such as developing effective decision-making skills, valuing self, coping with stress effectively.

The *Eating Disorders Inventory 3* (EDI-3) (Garner, 2004) is a revised version expansion of the EDI (Garner, 1984). It is used as a diagnostic tool, and is valid for use in a clinical setting to identify ED presence. The 98-item self-report questionnaire is divided into 12 subscales (Drive for Thinness, Bulimia, Body Dissatisfaction, Low Self-Esteem, Personal Alienation, Interpersonal Insecurity, Interpersonal Alienation, Interoceptive Deficits, Emotional Dysregulation, Perfectionism, Asceticism, and Maturity Fears). Three subscales are specific to ED, while the nine non-specific psychological subscales are relevant to ED. Items are rated on a four point system, and are coded from 0-4. The EDI-3 has six composites of Eating Disorder Risk, Ineffectiveness, Interpersonal Problems, Affective Problems, Overcontrol and General Psychological Maladjustment. High scores on the EDI-3 are indicative of a more severe ED-associated psychopathology. The EDI-3 subscales demonstrates good internal consistency (Cronbach's $\alpha = 0.75-0.92$) and good test-retest stability coefficients (0.95 for ED subscales, 0.93 for the general psychological subscales) (Clausen, Rosenvinge, Friborg, & Rokkedal, 2011).

The *Beck Anxiety Inventory* (BAI) (Beck, Epstein, Brown, & Steer, 1988) is a 21-item, multiple-choice, self-report inventory for measuring anxiety severity (score 0-3). Respondents rate feelings in the past week in relation to physiological and cognitive anxiety symptoms. A score of 16-63 indicates moderate to severe anxiety. The BAI demonstrates good internal consistency (Cronbach's $\alpha = 0.88-0.92$) and satisfactory test-retest reliability (Pearson's $r = 0.71-0.75$) (Osman et al., 2002).

The *Beck Depression Inventory 2* (BDI-II) (Beck, Steer, & Brown, 1996) is a 21-item, multiple-choice, self-report inventory used for measuring depression severity via a score of 0-3. Respondents rate feelings in the past week in relation to physiological and cognitive depressive symptoms. A score of 20-63 indicates moderate to severe depression. The BDI demonstrated good convergent validity of depression with the Patient Health Questionnaire (Pearson's $r = 0.84$) and good internal consistency (Cronbach's $\alpha = 0.95$) (Dum, Pickren, Carter-Sobell, & Sobell, 2008).

The *36-Item Short Form Health Survey* (SF-36) (Medical Outcomes Trust, 1992; cited by Ware, Kosinski, & Dewey, 2002) is a 36-item, self-report questionnaire on an individual's perceived quality of life relating to physical health and psychological wellbeing. Respondents rate statements on a 5-point scale; following completion, they receive an 8-scale health profile along with summary measures of health-related quality of life. Higher scores on the SF-36 indicate higher levels of perceived quality of life. The SF-36 reportedly has good internal consistency (Cronbach's $\alpha > 0.85$) and satisfactory construct validity (reliability coefficients > 0.75) (Brazier et al., 1992).

The *Motivational Stages of Change for Adolescents Recovering from an Eating Disorder* (MSCARED) (Gusella, Butler, Nichols, & Bird, 2003) is a brief questionnaire assessing an individual's readiness to change their behaviour in relation to their ED. Respondents categorise their motivational stage of change and rate perceived pros/cons of taking action against the ED. Higher scores indicate a stronger motivation to change ED behaviour. Gusella et al (2003) reported that MSCARED demonstrates good test-retest reliability (Pearson's $r = 0.92$) and evidence of concurrent validity with other measures of ED symptomatology. MSCARED is valid for use with adults and can be used in a mixed sample of clients with different ED diagnoses (Bardone-Cone, 2012; as cited by Leung et al., 2012).

TEDS Routine Measures: The Eating Disorders Examination Questionnaire (EDE-Q) is regularly completed by TEDS clinicians to indicate ED psychopathology and track improvement in symptoms over time. The measures below are also captured within TEDS as part of mandatory data capture within NHS Tayside.

The *Global Assessment of Functioning* (GAF) was developed as a measure of psychological disturbance (Jones, Thornicroft, Coffey, & Dunn, 1995). It is designed to indicate level of impairment, whether professional input is required and measure change over time (Pedersen & Karterud, 2012). A single GAF rating is selected by the clinician, ranging from 1 to 10; low scores indicate low functioning and persistent symptoms (danger of severely hurting self/others) and high scores indicate

superior functioning and no symptoms being present (Ekeröth & Birgegård, 2014). The GAF's psychometric properties are satisfactory (Mirandola et al., 2000; Pedersen & Karterud, 2012; Söderberg, Tungström, & Armelius, 2005) and reliability of GAF scores is acceptable, as long as clinicians rating them have sufficient experience and training (Pedersen & Karterud, 2012).

The *Clinical Global Impression (CGI) Scale* is a widely used and brief assessment tool, which was developed to provide a simplified measure of the clinician's overall impression of a patient's global functioning. It has been well evidenced as a research tool across a range of diagnoses (Busner & Targum, 2007; Guy, 1976). The CGI consists of the *CGI Severity (CGI-S)* ranging from '1-normal, not at all ill' to '7-among the most extremely ill patients', and the *CGI Improvement (CGI-I)* ranging from '1-very much improved' to '7-very much worse' (Dunlop, Gray, & Rapaport, 2017; Guy, 1976). The CGI has demonstrated utility in ED research and is a valid tool to assess patient functioning and clinician-rated improvement (Hudson et al., 1998). The *Patient Global Impression of Improvement (PGI-I)* is the patient version of the CGI-I, and rates improvement on the same 7-point scale (Arnold et al., 2004; Guy, 1976).

Procedure

All cases were recruited by TEDS clinicians during a routine clinical appointment. Initially, clinicians gave potential participants a brief verbal summary of the study, and provided a participant information sheet that they could take away with them. The information sheet included the CI contact details in case the potential participant had any questions relating to the study. TEDS patients were asked to complete an initial consent form with their contact details (email, telephone, brief demographic information), which they consented to be passed to the CI following the session. TEDS patients were informed that the CI would be in contact after 24 hours to provide the 'Smart Eating' programme guide (see Appendix K), and give further opportunity to ask questions about study involvement. At their next appointment, participants were given the opportunity to ask questions about the study and if they agreed to participate, were given time to complete the full consent form. This consent

form was co-signed by the treating clinician, who returned it to the CI. Website registration details and study login name for 'Smart Eating' were provided to participants, who could self-select their own password at registration. 'Smart Eating' measures (outlined above and summarised in Table 1) were completed via the programme website, with the six measures taking approximately 45-60 minutes to complete. Participants completed the health assessment measures at four time-points: time of consent/registration (T1), 4 weeks into the study (T2: midpoint), 12 weeks (T3: programme completion) and 6 months (T4: 3 month follow-up). All patient data gathered on cases involved in the study were stored on a password-protected, content management system. Participant materials are presented in Appendices H-K.

For the TEDS measures, the GAF, CGI-S, CGI-I and PGI-I were completed at every contact as part of mandatory data collection within the health board, however the EDE-Q was completed every 4th patient contact as an additional tool for monitoring ED symptom change. Body Mass Index (BMI) records are taken frequently in session as part of ongoing weight monitoring and risk management within TEDS. On average in TEDS, cases are seen in clinic 1-2 times per month depending on patient needs, clinician availability and wider clinical demand. If patients dropped out of the blended intervention, they would continue to receive specialist face-to-face input by TEDS for as long as was clinically required.

Ethical approval

Full ethical approval was sought and obtained from the East of Scotland NHS Research Ethics Committee (REC reference: 16/ES/0014, see Appendix F) who gave the research team permission to recruit patients from TEDS for study involvement. Thereafter, local approval was obtained from NHS Tayside Research and Development team (Tayside reference: 2015MH19, see Appendix G).

Data Analysis

Data analysis was undertaken using IBM Statistical Package for the Social Sciences (SPSS) for Windows (Version 24). Baseline clinical characteristics of all participants

providing full consent for study involvement were analysed, to explore between group differences of those registering for blended input and those who dropped-out at consent stage, specifically exploring: BMI, GAF, CGI-S and EDE-Q. Symptoms of ED, anxiety, depression, quality of life, motivation for change, overall psychological functioning, and clinician-rated and patient-rated improvement were explored pre and post blended intervention to explore statistical difference in mean scores.

Multilevel modelling (MLM) techniques have demonstrated utility when analysing repeated measures data (Buxton, 2008) and therefore MLM analysis was completed to explore symptom change over time, as well as across cases. MLM is useful as it manages missing data, making it possible to explore the degree that treatment varies across cases and to determine whether case characteristics explain this variation (Rindskopf & Ferron, 2014). Due to the limited power within the study, and unclear evidence as to an appropriate sample size for MLM (Buckley, Schwannauer, & Tarsia, 2017), a decision was made to focus on model fit as opposed to the significance of individual variables. The -2xLog-Likelihood (-2LL) statistic, a useful tool in model selection (Fernandez, 2010) was used to assess model fit, as it is a measure of deviance, whereby smaller deviance indicates improved model fit (Bird, 2016).

Visual analysis, the hallmark of single-case design, was also completed, whereby an individual's performance is visually explored by reviewing direction of data over time (trend), magnitude of data (level change) and stability (variability of data) (Lane & Gast, 2014). In short, the aim of visual analysis is to explore whether there is a functional relation between an intervention being introduced and subsequent behaviour change (Lane & Gast, 2014).

The acceptability of blended ICBT and CBT was also tentatively explored, in order to gain initial feedback from study cases on aspects of strength and areas of development for the 'Smart Eating' programme, which would hopefully help to inform future research plans.

Results

Cases

A brief summary of the eight cases explored in this case series are outlined on the next page (please note that information has been anonymised in order to maintain patient confidentiality).

Sample characteristics

Sample characteristics of the 30 patients who provided full consent to receive face-to-face CBT and ICBT (blended) were explored. Of these 30 patients, who consented to blended input, only eight ended up completing the registration process. At baseline, 93% (n=28) were female; only female patients ended up registering for the blended intervention. Moreover, 47% had an atypical diagnosis (specifically 27% (n=8) Atypical AN, 20% (n=6) Atypical BN), with AN identified as another prevalent diagnosis (23%, n=7), followed by BN (17%, n=5) and UFED (13%, n=4).

Cases registering for blended input (n=8): 50% (n=4) had a diagnosis of AN, 25% (n=2) had Atypical AN, with the remaining two participants receiving a diagnosis of Atypical BN and UFED respectively. Within this group, 63% had co-morbid diagnoses of either depression (37.5%, n=3) or mixed anxiety and depression (25.5%, n=2). BMI scores were in the underweight range for 75% (n=6) of this group, with the remaining 25% (n=2) in the healthy range. Six individuals had a history of ED for 1-2 years or less, with only 25% (n=2) having an ED for more than 3 years; this potentially indicates that their illness was more acute in nature. All patients were single, with 50% (n=4) living alone, 38% (n=3) living with parents, and one individual living with housemates. The majority lived in an urban environment (88%, n=7), with only one participant living in a rural setting. In terms of education, 63% (n=5) achieved an undergraduate degree qualification and one individual achieved a postgraduate degree qualification, with the remaining two individuals completing mandatory schooling. Regarding current occupation, five (63%) were students, two (25%) were professionals, and one worked as a sales assistant.

Case 1: A single, 27-year old female full-time student, who lived with her parents in a rural setting. She had a five year history of AN with a co-morbid diagnosis of mixed anxiety and depression, for which she previously received TEDS input over three years. She had no previous hospitalisations. At point of re-referral to TEDS by her GP, although her BMI was within healthy range, she presented with ED cognitions relating to a preoccupation with eating, shape and weight gain, low self-esteem and perfectionist tendencies. During this re-referral she was given a diagnosis of Atypical AN, and was started on psychiatric medication (Venlafaxine), monitored regularly by the TEDS psychiatrist.

Case 2: A single, 31-year old female who lived alone in an urban setting. Since completing her postgraduate study she had been working as a nurse. She initially was referred by her GP, and had a seven year history of AN. She had been known to TEDS for this duration as an open case due to low BMI, with intermittent service contact. Historically, she was known to CAMHS services and was treated in the past for ED in a young people's inpatient unit. She was referred by the GP. She had a co-morbid diagnosis of mixed anxiety and depression, and during study involvement was prescribed Quetiapine (75mg) psychiatric medication, with regular review by the TEDS psychiatrist.

Case 3: A single, 21-year old female, who was a full-time student and lived alone in an urban setting. She had a diagnosis of AN, and prior to this referral she had been treated for an ED in a private inpatient unit elsewhere. She was referred to TEDS by a specialist ED team in another NHS health board. She had a co-morbid diagnosis of depression, and was on regular Fluoxetine psychiatric medication, which was under ongoing review by the TEDS psychiatrist.

Case 4: A single, 24-year old female who worked full-time, and lived with her parents in an urban setting. Prior to referral she had not been seen by TEDS or any ED service, however she had previously been under the care of adult psychology services who referred her to TEDS for input. She had a history of ED for approximately 1-2 years, however had no previous hospitalisations in this time. She had a diagnosis of UFED, with a co-morbid diagnosis of depression. She was not understood to be on any regular psychiatric medication, and was under regular review by the dieticians within TEDS.

Case 5: A single, 21-year old female who was a full-time student. She reportedly lived at home with her parents, and their home was in an urban setting. She had a recent diagnosis of Atypical Anorexia Nervosa in light of a short duration of illness to date (9 months). This was her first presentation to ED services, and had no previous hospitalisations. She was referred by her GP, in light of a low BMI (15) at point of referral. Initially, she was treated by a male practitioner, however she requested a female clinician mid-way through input. She had no co-morbid diagnoses and was not known to be taking any regular psychiatric medication.

Case 6: A single, 26-year old female, who worked full-time and lives alone in an urban setting. With a history of and ED for over one year, she was referred to TEDS by her GP. She had a diagnosis of AN, and no co-morbid diagnoses. This was her first presentation to ED services, and she had no previous hospitalisations. She was not known to be taking any regular psychiatric medication.

Case 7: A single, 20-year old female who lived with flatmates in an urban setting. She was a full-time student. She was initially referred by her GP to TEDS for assessment, following a 6-month reported history of an ED and this was her first presentation to ED services. She had a diagnosis of Atypical AN and no co-morbid diagnoses. She had no previous hospitalisations and was not known to be on any regular psychiatric medications.

Case 8: A single, 26-year old female who was a full-time student, and lived alone in an urban setting. This was her first presentation to ED services, and she had a history of an ED for approximately 10 months. She had a diagnosis of Atypical BN and co-morbid diagnosis of depression, however she was not reported to be taking any regular psychiatric medication. This was her first presentation to ED services, and had no previous hospitalisations.

Cases providing full consent only (n=22): Atypical AN was the most prevalent diagnosis (27%, n=6), followed by Atypical BN and BN (both 23%, each n=5), 13.5% (n=3) with AN and 13.5% (n=3) had a diagnosis of UFED. Regarding co-morbid diagnoses, 45% (n=10) had a secondary diagnosis: mixed anxiety and depression (18%, n=4), depression (13.5%, n=3), anxiety (4.5%, n=1), panic disorder (4.5%, n=1), and generalised anxiety disorder (4.5%, n=1). Body mass index (BMI) scores were reported for 21 patients in this group, with 55% (n=12) falling in the healthy range, 23% (n=5) within the underweight range, and 18% (n=4) in the combined overweight or obese category. Where information on duration of illness was available, 32% (n=7) had a history of over six years of a diagnosed ED. No further demographic information on education, living situation, or work role were available for this group from their medical records.

Baseline clinical characteristics

Clinical characteristics were explored at baseline across groups (those registering and those providing full consent only), specifically BMI, EDE-Q Global and subscale scores, GAF, and CGI severity scores at point of receiving login details to facilitate programme registration (presented in Table 2). All data was collected from patient medical records; this had been previously obtained as part of mandatory service data collection. It was not possible to report all participant scores at baseline due to missing data in minimum data collected within the service. As a result, sample sizes have been reported to aid interpretation.

Independent samples t-tests were conducted to explore baseline group differences. Despite the large age range for cases providing full consent only, when mean scores were compared no significant differences were found in age between this group ($M=24.68$, $SD=7.89$), compared to those registered for the blended intervention ($M=24.50$, $SD=3.74$), $t(26)=.85$, $p=.933$. Although the range of BMI scores was considerably larger for those who gave full consent only, no significant differences were found between this group ($M=21.90$, $SD=6.16$) and those that registered for blended input ($M=18.14$, $SD=3.10$), $t(27)=1.63$, $p=.114$. Across clinical baseline scores, although individually many scores reached clinical significance, there was no statistically significant between group differences found for GAF scores ($t(28)=1.18$, $p=.248$), CGI severity scores ($t(28)=.93$, $p=.362$) and EDE-Q global scores ($t(22)=.70$, $p=.491$).

...../cont.

Table 2: Baseline descriptive statistical analysis

(*= clinically significant)

	Full consent only (n=22)			Registered for blended intervention (n=8)		
	M	SD	Range	M	SD	Range
Age (n=30)	24.6 8	7.8 9	16–43	24.5 0	3.74	20–31
Body Mass Index (BMI) (n=29, registered n=8)	21.9 0	6.1 6	15.2–41.8	18.1 4	3.10	15.5–24.7
Global Assessment of Functioning (GAF) (n=30)	61.5 5	7.6 4	50–75	58.1 3	4.70	50–65
Clinical Global Impression Severity (CGI-S) (n=30)	3.77	0.6 1	3–5	4.00	0.54	3–5
EDE-Q Global (n= 24, registered n=8)	3.54 *	1.6 6	0.79– 6.26*	3.98 *	0.87	2.19*– 4.73*
EDE-Q: Restraint subscale (n= 24, registered n=8)	2.95 *	1.5 9	0.00– 4.80*	3.60 *	1.14	1.60*– 4.80*
EDE-Q: Eating Concern subscale (n= 24, registered n=8)	3.05 *	1.4 2	0.20– 5.00*	4.03 *	1.07	2.40*– 5.80*
EDE-Q: Shape Concern subscale (n= 24, registered n=8)	4.23 *	1.9 3	0.75– 6.00*	4.36 *	1.19	1.75–5.38*
EDE-Q: Weight Concern subscale (n= 24, registered n=8)	3.65 *	1.6 8	0.00– 5.60*	3.95 *	1.66	1.00–5.40*

Retention and attrition

Overall patient retention was poor, with a 73% (n=22) dropout at baseline stage whereby full consenting cases did not continue to register nor engage in the blended intervention. Two participants voluntarily provided a reason for ceasing involvement, with one commenting they “*had too much going on*” and another indicated “*it’s hard to find the time to be able to commit properly*” so requested to be withdrawn from the study. As detailed, eight participants completed the entire registration process and were randomised to either receive full blended input (ICBT and face-to-face CBT) or internet-based psycho-education and face-to-face CBT. Only 62.5% (n=5) completed the health assessments at this baseline time-point (T1) and mid-point (T2), with 37.5% (n=3) of the sample continuing to complete the blended

intervention at end-point (T3) and follow-up (T4). The mean number of time-points completed was 2.88 (SD=1.89, range 1 to 5⁶) and face-to-face (F2F) sessions during blended intervention (T1-T3) was 4.75 (SD=1.98), with a range of two to seven sessions.

Changes in symptoms during blended intervention

ED symptom change (EDE-Q and EDI-3): For the eight cases reaching registration stages, paired sample t-tests were undertaken to compare ED symptoms pre and post-blended intervention. No significant change in EDE-Q Global scores was observed pre and post intervention. On a subscale level, however, a significant improvement in EDE-Q Restraint score was observed between baseline (M=3.60, SD= 1.11) and follow-up (M=2.07, SD=1.70), $t(2)=2.347$, $p=.05$. No significant changes in scores were observed in the EDE-Q Shape Concern and EDE-Q Weight Concern subscales between pre and post time-points. Across the EDI-3 measure, no significant change in symptom score was observed across subscales pre and post-blended intervention. Exploring clinician-rated severity of symptoms (CGI-S), there were no significant differences between mean scores pre and post-blended intervention.

Changes in quality of life, anxiety, depression, motivation for change, overall psychological functioning and improvement ratings: Paired t-tests were also undertaken to explore the impact of blended intervention on quality of life, anxiety, depression, overall psychological functioning and improvement ratings. No significant change in symptoms was observed across the quality of life measure (SF-36) when compared pre and post-intervention. No significant change in anxiety and depression symptoms was observed when comparing mean scores pre and post-intervention on the BAI and BDI-II. No significant changes were found in motivation for change, overall psychological functioning (GAF), clinician-rated improvement (CGI-I) and patient-rated improvement (PGI-I). In light of the above findings, further

⁶ Five time-points from registration to T4 inclusive

analysis using multilevel modelling techniques were used to explore symptom change over time in more detail.

Multi-level modelling of symptom change

An evidenced framework was utilised (Singer & Willett, 2003) to model symptom change over time (Bird, Tarsia, & Schwannauer, n.d.; Buckley, Schwannauer, & Tarsia, 2017). As outlined in the “Study aims and hypotheses” section, Models 1-4 were created to explore the impact of time on overall patient psychological functioning (GAF score), and separately patient interpretation of symptom changes (PGI-I). Models 5-7 leveraged baseline models to explore whether predictor variables (EDE-Q Global score, BMI, CGI-S) accounted for any further variance in the model and improved model fit. All multi-level modelling results are outlined in Table 3 and are explained in detail below.

Global Assessment of Functioning (GAF): For Model 1, significant variation in intercepts was observed, with the intraclass correlation coefficient (ICC) indicating that approximately 59.9% of variance in GAF score at baseline was attributable to the difference between participants, and that further exploration of model fit was warranted. For Model 2 (Unconditional Linear Growth Model), adding time into the model did not result in a statistically significant change to GAF scores over time, without an improvement in model fit observed as -2LL increased from 664 to 666. When allowing for slope variation (Model 3), improvement in model fit was observed with -2LL decreasing from 666 to 621, however the association between time and GAF score was not significant.

To account for the auto-regressive nature of data, Model 4 was used to model the correlation structure of within subject effects. A significant rho parameter ($\rho = .82$, $p < .01$) indicated a relationship between overall psychological functioning as indicated by the GAF at adjacent time-points, producing a substantial improvement in model fit (-2LL decreasing from 621 to 525). Modelling EDE-Q global scores as a predictor variable (Model 5), (dummy coded as ‘Clinically unwell’ if score 4-6, or

‘Clinically well’ if scoring <4), there was no association between EDE-Q and overall functioning (GAF), and model fit did not improve either as -2LL increased from 525 to 532. By adding in BMI as a predictor variable for Model 6, model fit improved as -2LL decreased from 525 to 521, yet BMI was not significantly associated with overall psychological functioning (GAF). Similarly, for Model 7 when CGI-S was added as a predictor variable, model fit improved further (-2LL decreasing 521 to 501). In this model, CGI-S was significantly negatively associated with GAF scores over time, indicating that a reduction in clinician-rated severity is associated with change in overall psychological functioning scores over time.

Patient Global Impression of Improvement (PGI-I): In Model 1, a significant variation in intercepts was observed, with the ICC calculated and approximately 53% of variance in PGI-I score being explained by participant differences. Similar to Model 2 of the GAF, a model fit improvement was not indicated as -2LL increased slightly (268 to 269), however, by adding time to account for growth in this model, a significant finding indicated patient-rated improvement scores improved over time. When allowing for slope variation in Model 3, model fit improved with -2LL reducing from 269 to 259, however the association between time and PGI-I score was not significant.

When exploring within-subjects variance in Model 4 a significant rho parameter ($\rho=.51$, $p<.01$) indicated a positive relationship between patient interpretation of symptom changes at adjacent time-points, and a further improvement in model fit was identified (-2LL decreased from 259 to 241). Through the addition of EDE-Q (Model 5) and BMI (Model 6) as separate predictor variables, there was no improvement in model fit with -2LL increased slightly from 241 to 245 in Model 5 and 242 in Model 6. There was a non-significant relationship between EDE-Q and BMI, however when exploring change in BMI over time, there was a significant association with patient-reported improvement (PGI-I). When adding clinician-rated severity of symptoms (CGI-S) into Model 7, there was an improvement in model fit observed with -2LL decreasing from 241 to 231. Clinician-rated severity was not associated with patient-reported improvement.

Table 3: Summary statistics and model fit across cases

Dependent outcome: GAF							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	58.97*** (2.26)	59.43*** (2.33)	57.32*** (2.14)	56.60*** (1.85)	56.37 (1.35)	57.14*** (2.28)	56.18*** (2.85)
Time	-	-.07 (.10)	1.10 (1.26)	1.089 (1.17)	1.03 (1.25)	1.02 (1.20)	1.43 (1.19)
EDE-Q	-	-	-	-	0.97 (1.27)	-	-
EDE-Q*Time	-	-	-	-	-.08 (.13)	-	-
BMI	-	-	-	-	-	-0.88 (1.44)	-
BMI*Time	-	-	-	-	-	.09 (.16)	-
CGI_S	-	-	-	-	-	-	.36 (2.32)
CGI_S*Time	-	-	-	-	-	-	-.50* (.21)
-2LL	663.78	666.01	620.82	524.53	531.65	521.48	501.11
Dependent outcome: PGI							
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	3.18*** (.30)	3.40*** (.33)	3.41*** (.32)	3.43*** (.31)	3.44*** (.36)	2.94*** (.40)	3.02*** (.51)
Time	-	-.03* (.01)	-.04 (.03)	-.04 (0.3)	-.02 (.03)	.03 (.04)	-.06 (.04)
EDE-Q	-	-	-	-	-.04 (.37)	-	-
EDE-Q*Time	-	-	-	-	-.03 (.04)	-	-
BMI	-	-	-	-	-	.66 (.36)	-
BMI*Time	-	-	-	-	-	-.10** (.04)	-
CGI_S	-	-	-	-	-	-	.38 (.52)
CGI_S*Time	-	-	-	-	-	-	.07 (.04)
-2LL	267.62	268.81	259.03	241.35	245.31	242.81	231.39

Overall model fit improved between Models 1 to 7 on both GAF and PGI-I, however further variance remains unaccounted for. Visual analysis was deemed appropriate to further explore individual symptom change over time, particularly to explore the stability, trend and change in level of data (Cuthill, Espie, & Cooper, 2003), as well as to identify whether the variance was accounted for by another variable.

Visual Analysis

Scores across all eight patients registering for the blended intervention were plotted and are presented in Figures 1.1-1.3 (marked A- pre-intervention, B- during intervention, C- post-intervention). Changes in overall psychological functioning (GAF), eating disorder symptoms (EDE-Q Global score), clinician-rated severity (CGI-S), clinician-rated and patient-rated improvement (CGI-I, PGI-I), were explored in both completers (completed T1-T4 of blended intervention) and non-completers (drop-out before T3). Regarding stability of data, the stability criterion is indicated as being that 80% of all data should be within 25% of the median score (Buckley et al., 2017; Lane & Gast, 2014). For all cases, data stability varied. During pre-treatment stage (A), all cases were 100% stable across GAF, EDE-Q, CGI-S and improvement scores, yet for Case 4 CGI-I and PGI-I varied (<80%). During blended intervention (B), most cases remained 100% stable, however Case 2 and 5 scores varied within improvement ratings, falling below the 80% cut-off. Similarly, Case 5 varied during this phase, with CGI-I ratings (<80%). During post-intervention phase (C), data was more varied across cases. Only 4 cases scores on the GAF, EDE-Q, CGI-S and improvement scores met stability criterion, with less than 80% of data being below 25% of the median score.

Figure 1.1 Visual analysis: case symptom change over time

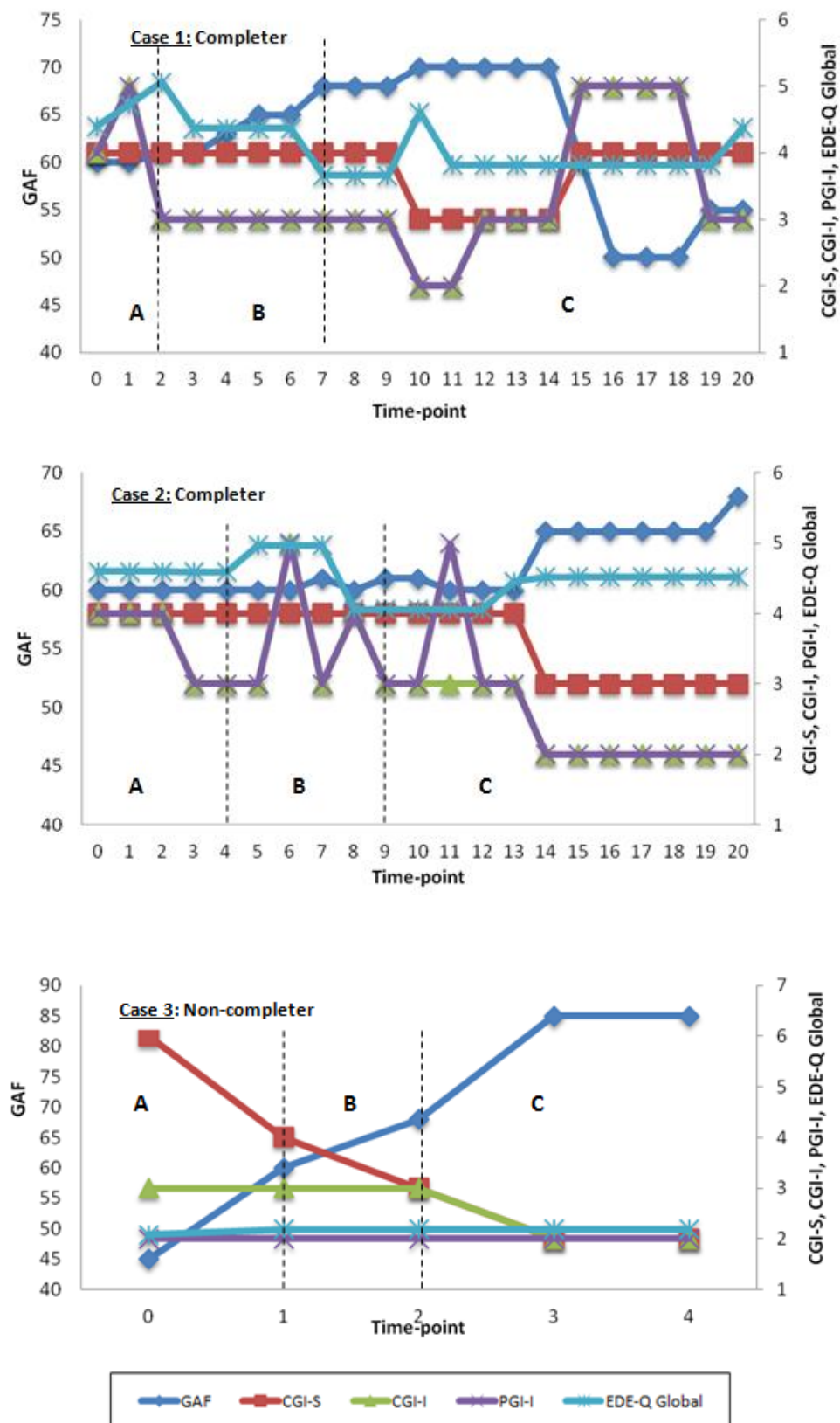


Figure 1.2 Visual analysis: case symptom change over time

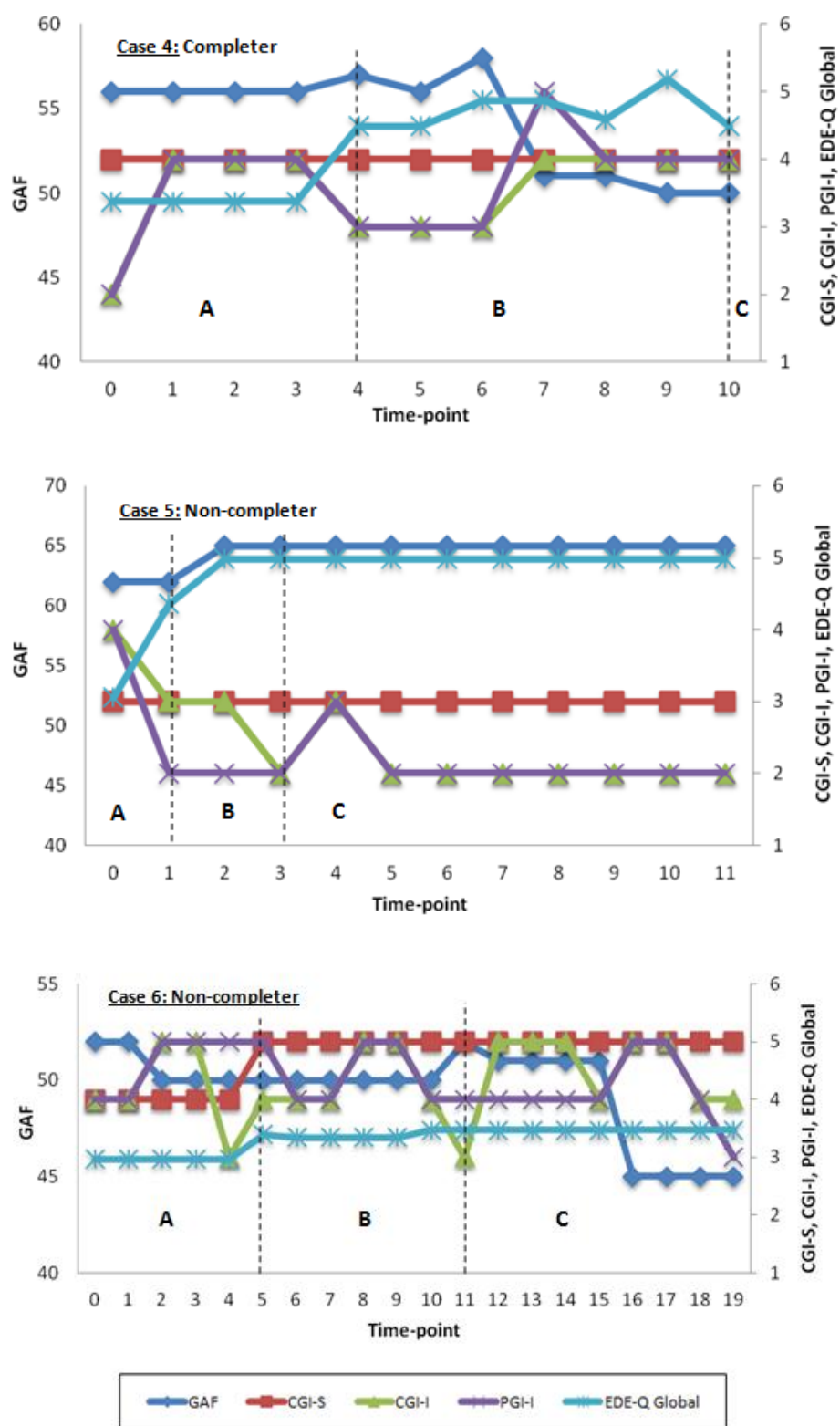
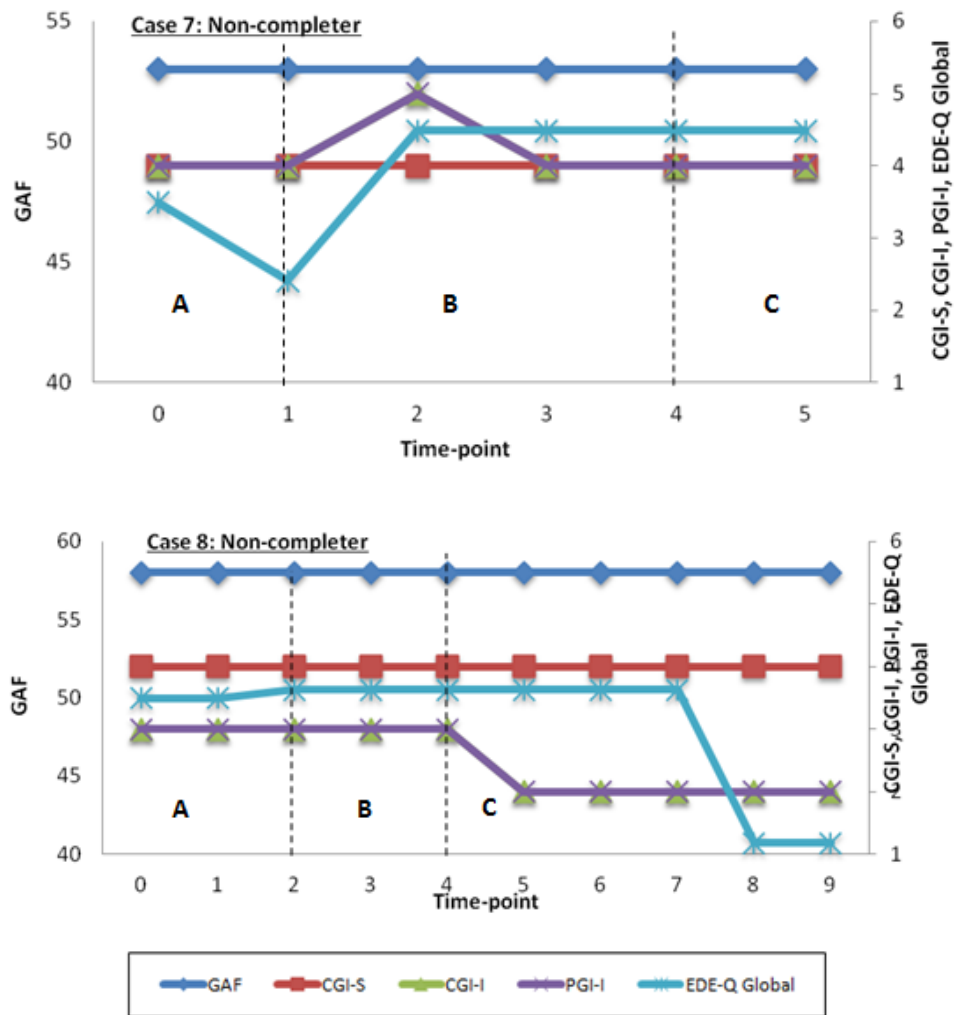


Figure 1.3 Visual analysis: case symptom change over time



Trend of scores was initially explored, with a varied trend across completers observed compared to non-completers, particularly in GAF and EDE-Q scores. Although non-completers had fewer data-points, their scores appeared generally more static during the study period. For two completers (Case 1 and 2), there was zero trend in CGI-S scores across baseline/blended intervention, however post-intervention there was a varied trend in scores for Case 1 and a descending trend for Case 2, indicating a reduction in clinician-rated severity of ED symptoms. Across both cases, clinician-rated improvement and patient-rated improvement varied together over time. Symptom improvement is indicated for Case 3, considering the

downward trend of ED symptoms and severity ratings, and increase in overall psychological functioning and improvement ratings.

Across cases, level change was explored pre and post blended intervention. As there are no known recommendations for assessing clinically significant change on the GAF measure, change in descriptive categories were explored (Jones, Thornicroft, Coffey, & Dunn, 1995). Half the sample (n=4) demonstrated reduction in GAF scores from pre to post-intervention, with two cases (4 and 6) demonstrating a reduction from “severe symptoms” to “moderate symptoms”, and two cases (2 and 3) demonstrating a reduction from “moderate symptoms” to “some mild symptoms”. No changes in GAF descriptive rating were observed for cases 1 and 5 (“some mild symptoms”), or cases 7 and 8 (“moderate symptoms”) when comparing pre and post-intervention. A score change of 2-points is indicated in order to assess reliable change on the CGI-S (Kelly, 2010); this was not achieved for any of the cases. Case 3 was the only patient demonstrating a change in clinician-rated severity of symptoms pre and post-intervention, with their score reducing by one point from “moderately ill” to “mildly ill”. Clinically significant change on the EDE-Q is indicated where the individual is rated to be closer to the functional population mean after treatment than the dysfunctional population mean (Aardoom, Dingemans, Slof Op’t Landt, & Van Furth, 2012; Jacobson & Truax, 1991). No change in eating disorder symptoms pre and post treatment (as indicated by the EDE-Q) were observed for 6 cases, with cases 2, 4 and 5 all indicating clinically significant ED symptomatology, and cases 3, 6 and 8 presenting with sub-clinical ED symptoms throughout. Case 1 was the only individual to experience clinically significant improvement in ED symptoms. Comparatively, case 7 experienced deterioration in ED symptoms by post-treatment, with an increase in symptoms that reached clinical significance. Regarding clinician-rated and patient-rated improvement, five cases did not observe any change in improvement rating pre and post intervention⁷. Cases 5 and 6 both indicated improvements by post-intervention on clinician and patient rated measures, however Case 4 was indicated to have deteriorated on both

⁷ All cases were seen by TEDS clinicians prior to blended intervention, making it possible to comment on improvement.

measures of improvement from “minimally improved” pre-intervention, to “no change” post-intervention.

Participant feedback

All three cases completing the blended intervention provided written feedback via an open feedback questionnaire (see Appendix L). Across the three cases there was mixed feedback, with concerns raised that the website was not user-friendly and had poor design, particularly as it lacked an ability to review previous health assessment scores to track progress. For one case, they reported it drew their attention to “*see how bad my eating habits were....wake up call as to things I needed to change*”. For all cases, they indicated that the concept of a supportive ICBT programme alongside usual treatment is a good idea, however they highlighted it needs to be accessible across devices (computer, tablet, laptop). Feedback was limited to these cases so any interpretation is very tentative, however early indications here suggest that blended interventions are acceptable to some, as long as they provide good content and use all popular technology platforms.

Discussion

Summary of findings

This study conducted a detailed exploration of individual ED cases in retrospect, in order to determine whether blended ICBT and face-to-face CBT was associated with: reduction in symptoms associated with ED, anxiety, and depression; improvements in quality of life indicators, motivation for change, overall psychological functioning, and clinician- and patient-rated change. To test study hypotheses (a) and (b), pre and post blended intervention ED symptoms were explored, with no significant changes in mean score observed (with the exception of an improvement noted for the EDE-Q Restraint subscale score). Although this would indicate blended ICBT and face-to-face CBT reduced patients’ restraint and avoidance over eating, along with food avoidance and dietary rules followed (Fairburn & Beglin, 1994), it is unclear which aspect(s) of the blended intervention impacted on symptom improvement.

Utilising model fit statistics and data trends, multilevel modelling (MLM) explored patterns of change to test hypotheses, specifically exploring an association between receiving blended CBT and improvement in global functioning scores and patient-rated improvement ratings, and whether they were predicted by ED symptom severity (EDE-Q, BMI) and clinician-rated severity (CGI-S). Although little change in overall psychological functioning and patient-rated improvement scores were observed over time, model fit improved when allowing for individuals experiencing change differently over time, therefore indicating that time accounted for some variance. Severity of symptoms (as indicated by EDE-Q Global scores) did not account for any variance, however when explored using clinician-rated measures (CGI-S, BMI), the largest improvement in model fit for overall psychological functioning and patient-rated improvement respectively was observed. This would indicate that these measures of symptom severity are connected to psychological functioning and patient-rated improvement. It is possible that with sufficient power there might have been a significant effect between variables, however it is difficult to prove or disprove based on this study's findings.

Visual analysis undertaken to explore study hypotheses relating to symptom change found a varied trend across cases, with a lack of level change from pre to post input, as well as non-completers appearing to have more static symptoms during the intervention phase. Plausibly, failing to observe symptom improvement may, in part, explain disengagement by cases from treatment, which is supported by a recent meta-analysis whereby early ED symptom improvement enhances therapeutic alliance and ED treatment outcome (Graves et al., 2017). Acceptability of blended ICBT and face-to-face CBT as a treatment option was also explored via case feedback as outlined by study aims. Although unable to be rigorously analysed due to the limited number of cases providing feedback, tentative support for blended ED treatment as a concept can only be assumed, suggesting future investigation is warranted.

Overall, study findings were inconclusive regarding symptom change attributable to the blended ED intervention, and therefore further research is required as outlined latterly in this paper.

Strengths and limitations

This study is the first known case series exploring blended ICBT and face-to-face CBT for adults with ED in Scotland. A relative strength was the use of an existing evidenced ICBT programme, ‘Smart Eating’, which has already demonstrated clinical value in improving ED symptoms and enhancing patient’s motivation to overcoming their ED in other geographical locations (Leung et al., 2013). Study measures were clinically relevant and well-evidenced in exploring changes in ED, anxiety and depression symptoms, motivation for change, quality of life and overall psychological functioning; however, the limited number of data-points across cases negatively impacted on the possibility of observing meaningful conclusions. Additionally, it should be noted that subjectivity is unavoidable in clinician-rated measures. Within this study, variables such as years of experience and therapy model fidelity were unaccounted for so it is unknown whether these could have been important factors. In-depth exploration of individual cases facilitated detailed description of outcomes, particularly as exploring a new intervention with a smaller population can be useful prior to a definitive trial (Bhandari & Chan, 2011). As study cases continued within the TEDS service post-blended intervention, adequate follow-up data, further strengthened the value of this case series (Bhandari & Chan, 2011).

A key strength of this study was the comprehensive data analysis undertaken to explore symptom change, model fit and data trends across cases. Using MLM as a tool to analyse this repeated measures data was a relative strength, as it effectively managed missing data-points, accounted for individual data captured at different time-points, and accounted for the autoregressive nature of data (Buxton, 2008). However, the limited sample size increased the risk of type 1 and type II errors, and increased the risk of ‘overfitting’ predictor variables into the model (Maas & Snijders, 2003; Vidotto, Vermunt, & van Deun, 2017).

The small sample size negatively impacted on the ability to effectively identify whether meaningful change in symptoms occurred, and although it is unsurprising considering the case series methodology, with only three cases completing the blended intervention, generalisability of findings is limited. Nevertheless, the

improvement in model fit observed when adding predictor variables of BMI and CGI-I could indicate that, if the study were to be adequately powered, then we might expect to detect effects of those variables. Further research would therefore be beneficial to explore the relationship between ED symptom severity and overall psychological functioning, as well as patient-rated improvement.

Clinical implications and future research directions

It is plausible that various factors may have acted as barriers to behaviour change in this study. There is, therefore, insufficient evidence to determine whether a blended ICBT and face-to-face intervention for ED is either effective or ineffective. In this study, all cases presented with complex symptom profiles, most had been prescribed with psychiatric medications to treat comorbidities, and some had previously received ED treatment. Therefore, assuming that this group is homogenous poses a challenge as it appears that, aside from blended intervention, there is a range of potential factors that might impact on treatment outcome. Research has demonstrated that a number of factors as baseline predictors are associated with better ED treatment outcome at the end of treatment and follow-up, including higher BMI, fewer binge/purge behaviours, increased motivation for recovery, lower depression, lower shape/weight concern, fewer comorbidities, and better interpersonal functioning with fewer family problems (Vall & Wade, 2015). Gender is another factor that has been observed to impact on ED treatment outcome with males with BN or OSFED who complete treatment presenting with high remission rates compared to women (Agüera et al., 2017). Furthermore, degree of treatment completion appeared to impact on outcome, as individuals who reached mid-way in treatment do not dropout (Agüera et al., 2017). Considering blended ICBT and face-to-face CBT is a new research area, further exploration of predictors, moderators and mediators of ED treatment outcome are required to inform individualised treatment (Vall & Wade, 2015). Investigation of the therapy alliance in blended interventions and the impact on treatment outcome would be useful considering the proposed ‘technology alliance’, i.e. the attachment an individual has with their technology device (Christensen, Griffiths, & Farrer, 2009). This is especially important as some researchers indicate internet-based treatments attract individuals preferring more

distal contact, and preserve anonymity compared with receiving face-to-face treatments (Christensen, Griffiths, & Farrer, 2009).

On an individual case basis within this study, blended ICBT and face-to-face CBT appeared to be an acceptable treatment option, however as in the wider blended treatment literature further research is needed to explore various design/content ‘blends’ for ED patients that allow flexible treatments to meet a person’s needs/preferences (Wentzel, Vaart, Bohlmeijer, & Gemert-Pijnen, 2016). Nevertheless, blended treatments offer a potentially cost-effective complement to face-to-face therapy (Andersson, Cuijpers, Carlbring, Riper, & Hedman, 2014). There is increasing research evidence exploring how to best benefit from blended online and face-to-face mental healthcare, with instruments like “Fit for Blended Care” emerging to guide clinicians on how to address barriers to treatment, including crisis risk and distance communication concerns when accessing treatment away from clinic setting, as well as how to leverage facilitators like social support in blended care (Wentzel, Vaart, Bohlmeijer, & Gemert-Pijnen, 2016). An instrument such as “Fit for Blended Care” may be worthy of exploration in the ED population, to help overcome treatment barriers and make best use of facilitators to support improvements.

Within the wider context of leveraging technology in ED treatments, there is a lack of consensus on future research directions. A recent review indicated there is still a lack of established evidence-base to support widespread usage of ICBT in clinics (Agras, Fittsimmons-Craft, & Wilfley, 2017). Nevertheless, early studies exploring feasibility of internet-based ED treatments are promising, with further randomised controlled trials comparing ICBT and CBT (and including cost-effectiveness analysis) recommended (Agras et al., 2017; Sau Fong Leung, Joyce Ma, & Russell, 2013; Sau Fong Leung, Ma, & Russell, 2012; Smink, Van Hoeken, & Hoek, 2012). Most ICBT programmes have traditionally utilised offline packages, providing basic content (Loucas et al., 2014) and relying on self-report measures rather than standardised assessment measures (Agras et al., 2017). Further consideration to advance programme content and use standardised assessments are warranted, with

opportunities to deliver CBT by maximise popular technology platforms such as virtual reality (VR) and mobile applications.

Overall conclusions

Findings from this study are inconclusive as to whether blended ICBT and face-to-face CBT improve symptoms for adults with ED. There were possible indications that severity of ED symptoms is associated with overall psychological functioning and patient-rated improvement, however these are tentative due to the small sample. Further exploration is needed into the factors predicting ED blended treatment outcome, with instruments available to support blended care being tailored to an individual. Modernisation of ICBT packages is also needed, which incorporate standardised assessment measures and maximise popular technology platforms.

Conflict of interest declaration

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Appendices

Appendix A: Systematic Review & Empirical project – Author guidelines for European Eating Disorders Review

Author Guidelines

Manuscript Submission

European Eating Disorders Review has now adopted ScholarOne Manuscripts, for online manuscript submission and peer review. The new system brings with it a whole host of benefits including:

- Quick and easy submission
- Administration centralised and reduced
- Significant decrease in peer review times

From now on all submissions to the journal must be submitted online at <http://mc.manuscriptcentral.com/erv>. Full instructions and support are available on the site and a user ID and password can be obtained on the first visit. If you require assistance then click the Get Help Now link which appears at the top right of every ScholarOne Manuscripts page. If you cannot submit online, please contact Maurine Balansag in the Editorial Office (EEDRedoffice@wiley.com).

Illustrations must be submitted in electronic format. Save each figure as a separate file, in **TIFF** or **EPS** format preferably, and include the source file. We favour dedicated illustration packages over tools such as Excel or Powerpoint. Grey shading (tints) are not acceptable. Lettering must be of a reasonable size that would still be clearly legible upon reduction, and consistent within each figure and set of figures. Supply artwork at the intended size for printing. The artwork must be sized to the text width of 7 cm (single column) or 15 cm (double column).

Manuscript style. All submissions, including book reviews, should be double-spaced and clearly legible.

The first page should contain the **title** of the paper, full names of all authors, the address where the work was carried out, and the full postal address including telephone, fax number and email to whom correspondence and proofs should be sent. The name(s) of any **sponsor(s)** of the research contained in the paper, along with **grant number(s)** should also be included. The second sheet should contain an **abstract** of up to 150 words. An abstract is a concise summary of the whole paper, not just the conclusions, and is understandable without reference to the rest of the paper. It should

contain no citation to other published work. Include up to five **keywords** that describe your paper for indexing purposes.

- **Research articles** reporting new research of relevance as set out in the aims and scope should not normally exceed 6000 words with no more than five tables or illustrations. They should conform to the conventional layout: title page, summary, introduction, materials and methods, results, discussion, acknowledgements and references. Each of these elements should start on a new page. Authors may not find it necessary to use all of these subdivisions, and they are listed here only as a guide.
- **Review articles:** Systematic and meta-analytic review papers are welcomed if they critically review the available literature in a topic that will enhance clinical practice. Articles should have clear focus and enough number of studies should be available for a substantive review paper. Studies that only describe or list previous studies without a critical overview of the literature will not be considered.
 - Word Limit: 5,000 (excluding abstract, references, tables or figures).
 - Abstract: 250 words.
 - References: 50.
 - Figures/Tables: 5 maximum, but should be appropriate to the material covered. Additional tables might be included as supplementary information, if needed.Review articles must follow the [PRISMA](#) Guidelines. Authors may want to have a look at the review check lists that reviewers when assessing review articles.
- **Brief reports** should concisely present the essential findings of the author's work and be comprised of the following sections: Abstract, Introduction and Aims, Method, Results, Discussion, and References. Tables and/or figures should be kept to a minimum, in number and size, and only deal with key findings. In some cases authors may be asked to prepare a version of the manuscript with extra material to be included in the online version of the review (as supplementary files). Submissions in this category should not normally exceed 2500 words in length.

Brief reports bring with them a whole host of benefits including: quick and easy submission, administration centralised and reduced and significant decrease in peer review times, first publication priority (this type of manuscript will be published in the next available issue of the journal).

- **Case Reports** The journal does not accept case reports for publication. Authors of case reports are encouraged to submit to the Wiley Open Access journal, Clinical Case Reports www.clinicalcasesjournal.com which aims to directly improve health outcomes by identifying and disseminating examples of best clinical practice.

Reference style . The APA system of citing sources indicates the author's last name and the date, in parentheses, within the text of the paper.

A. A typical citation of an entire work consists of the author's name and the year of publication .

Example: Charlotte and Emily Bronte were polar opposites, not only in their personalities but in their sources of inspiration for writing (Taylor, 1990). Use the last name only in both first and subsequent citations, except when there is more than one author with the same last name. In that case, use the last name and the first initial.

B. If the author is named in the text, only the year is cited .

Example: According to Irene Taylor (1990), the personalities of Charlotte. . .

C. If both the name of the author and the date are used in the text, parenthetical reference is not necessary .

Example: In a 1989 article, Gould explains Darwin's most successful. . .

D. Specific citations of pages or chapters follow the year .

Example: Emily Bronte "expressed increasing hostility for the world of human relationships, whether sexual or social" (Taylor, 1988, p. 11).

E. When the reference is to a work by two authors, cite both names each time the reference appears .

Example: Sexual-selection theory often has been used to explore patters of various insect matings (Alcock & Thornhill, 1983) . . . Alcock and Thornhill (1983) also demonstrate. . .

F. When the reference is to a work by three to five authors, cite all the authors the first time the reference appears. In a subsequent reference, use the first author's last name followed by *et al* . (meaning "and others") .

Example: Patterns of byzantine intrigue have long plagued the internal politics of community college administration in Texas (Douglas *et al* ., 1997)

When the reference is to a work by six or more authors, use only the first author's name followed by *et al* . in the first and all subsequent references.

The only exceptions to this rule are when some confusion might result because of similar names or the same author being cited. In that case, cite enough authors so that the distinction is clear.

G. When the reference is to a work by a corporate author, use the name of the organization as the author .

Example: Retired officers retain access to all of the university's educational and recreational facilities (Columbia University, 1987, p. 54).

H. Personal letters, telephone calls, and other material that cannot be retrieved are not listed in References but are cited in the text .

Example: Jesse Moore (telephone conversation, April 17, 1989) confirmed that the ideas. . .

I. Parenthetical references may mention more than one work, particularly when ideas have been summarized after drawing from several sources. Multiple citations should be arranged as follows .

Examples:

- List two or more works by the same author in order of the date of publication: (Gould, 1987, 1989)
- Differentiate works by the same author and with the same publication date by adding an identifying letter to each date: (Bloom, 1987a, 1987b)
- List works by different authors in alphabetical order by last name, and use semicolons to separate the references: (Gould, 1989; Smith, 1983; Tutwiler, 1989).

All references must be complete and accurate. Where possible the DOI for the reference should be included at the end of the reference. Online citations should include date of access. If necessary, cite unpublished or personal work in the text but do not include it in the reference list. References should be listed in the following style:

Journal Article

Gardikiotis, A., Martin, R., & Hewstone, M. (2004). The representation of majorities and minorities in the British press: A content analytic approach. *European Journal of Social Psychology*, 34 , 637-646. DOI: 10.1002/ejsp.221

Book

Paloutzian, R. F. (1996). *Invitation to the psychology of religion* (2nd ed.). Boston: Allyn and Bacon.

Book with More than One Author

Natarajan, R., & Chaturvedi, R. (1983). *Geology of the Indian Ocean* . Hartford, CT: University of Hartford Press.

Hesen, J., Carpenter, K., Moriber, H., & Milsop, A. (1983). *Computers in the business world* . Hartford, CT: Capital Press. and so on.

The abbreviation *et al.* is not used in the reference list, regardless of the number of authors, although it can be used in the text citation of material with three to five authors (after the initial citation, when all are listed) and in all parenthetical citations of material with six or more authors.

Web Document on University Program or Department Web Site

Degelman, D., & Harris, M. L. (2000). *APA style essentials* . Retrieved May 18, 2000, from Vanguard University, Department of Psychology Website: http://www.vanguard.edu/faculty/ddegelman/index.cfm?doc_id=796

Stand-alone Web Document (no date)

Nielsen, M. E. (n.d.). *Notable people in psychology of religion*. Retrieved August 3, 2001, from <http://www.psywww.com/psyrelig/psyrelpr.htm>

Journal Article from Database

Hien, D., & Honeyman, T. (2000). A closer look at the drug abuse-maternal aggression link. *Journal of Interpersonal Violence*, 15, 503-522. Retrieved May 20, 2000, from ProQuest database.

Abstract from Secondary Database

Garrity, K., & Degelman, D. (1990). Effect of server introduction on restaurant tipping. *Journal of Applied Social Psychology*, 20, 168-172. Abstract retrieved July 23, 2001, from PsycINFO database.

Article or Chapter in an Edited Book

Shea, J. D. (1992). Religion and sexual adjustment. In J. F. Schumaker (Ed.), *Religion and mental health* (pp. 70-84). New York: Oxford University Press.

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Appendix B: Systematic Review – List of excluded studies & reasons

#	Year	Authors	Title	Journal	Reason for exclusion
1	2014	Barnes R.D., White M.A., Martino S., Grilo C.M.	A randomized controlled trial comparing scalable weight loss treatments in primary care	Obesity	Included subthreshold ED patients
2	2017	Aardoom J.J., Dingemans A.E., Fokkema M., Spinhoven P., Van Furth E.F.	Moderators of change in an Internet-based intervention for eating disorders with different levels of therapist support: What works for whom?	Behaviour Research and Therapy	Subthreshold symptoms only
3	2014	Hotzel K., von Brachel R., Schmidt U., Rieger E., Kosfelder J., Hechler T., Schulte D., Vocks S.	An Internet-based program to enhance motivation to change in females with symptoms of an eating disorder: a randomized controlled trial.	Psychological Medicine	Positive screen for ED symptoms. No formal diagnosis
4	2014	Gulec H., Moessner M., Tury F., Fiedler P., Mezei A., Bauer S.	A randomized controlled trial of an internet-based posttreatment care for patients with eating disorders	Telemedicine journal and e-health	Positive screen for ED symptoms. No formal diagnosis
5	2013	Ruwaard J., Lange A., Broeksteeg J., Renteria-Agirre A., Schrieken B., Dolan C.V., Emmelkamp P.	Online cognitive-behavioural treatment of bulimic symptoms: a randomized controlled trial.	Clinical psychology & psychotherapy	Positive screen for ED symptoms. No formal diagnosis
6	2007	Ljotsson B., Lundin C., Mitsell K., Carlbring P., Ramklint M., Ghaderi A.	Remote treatment of bulimia nervosa and binge eating disorder: A randomized trial of Internet-assisted cognitive behavioural therapy	Behaviour Research and Therapy	Included subthreshold ED patients
7	2011	Carrard I., Crepin C., Rouget P., Lam T., Golay A., Van der Linden M.	Randomised controlled trial of a guided self-help treatment on the Internet for binge eating disorder	Behaviour Research and Therapy	Included subthreshold ED patients
8	2013	Leung S.F., Ma J., Russell J.	Enhancing motivation to change in eating disorders	International Journal of	Positive screen for ED symptoms. No

			with an online self-help program	Mental Health Nursing	formal diagnosis
9	2007	Paxton S.J., McLean S.A., Gollings E.K., Faulkner C., Wertheim E.H.	Comparison of face-to-face and internet interventions for body image and eating problems in adult women: An RCT	International Journal of Eating Disorders	Self-report disordered eating
10	2011	Ertelt T.W., Crosby R.D., Marino J.M., Mitchell J.E., Lancaster K., Crow S.J	Therapeutic factors affecting the cognitive behavioral treatment of bulimia nervosa via telemedicine versus face-to-face delivery	International Journal of Eating Disorders	Excluded format of e-therapy (telemedicine)
11	2013	Leung S.F., Joyce Ma L.C., Russell J.	An open trial of self-help behaviours of clients with eating disorders in an online programme	Journal of Advanced Nursing	Self-report disordered eating
12	2006	Gollings E., Paxton S.J.	Comparison of internet and face-to-face delivery of a group body image and disordered eating intervention for women: A pilot study	Eating Disorders	Positive screen for ED symptoms. No formal diagnosis
13	2013	Leung SF; Ma JL; Russell J.	Enhancing quality of life in people with disordered eating using an online self-help programme.	Journal of Eating Disorders	Positive screen for ED symptoms. No formal diagnosis
14	2016	Aardoom JJ; Dingemans AE; Spinhoven P; van Ginkel JR; de Rooij M; van Furth EF.	Web-Based Fully Automated Self-Help With Different Levels of Therapist Support for Individuals With Eating Disorder Symptoms: A Randomized Controlled Trial.	Journal of Medical Internet Research	Self-report disordered eating
15	2008	Mitchell J.E., Crosby R.D., Wonderlich S.A., Crow S., Lancaster K., Simonich H., Swan-Kremeier L., Lysne C., Cook Myers T.	A randomized trial comparing the efficacy of cognitive-behavioral therapy for bulimia nervosa delivered via telemedicine versus face-to-face	Behaviour Research and Therapy	Excluded format of e-therapy (telemedicine)
16	2001	Robinson P.H., Serfaty M.A.	The use of e-mail in the identification of bulimia nervosa and its treatment	European Eating Disorders Review	Positive screen for ED symptoms. No formal diagnosis

17	2003	Robinson P., Serfaty M.	Computers, e-mail and therapy in eating disorders.	European Eating Disorders Review	Positive screen for ED symptoms. No formal diagnosis
18	2007	Shapiro J.R., Reba-Harrelson L., Dymek- Valentine M., Woolson S.L., Hamer R.M., Bulik C.M.	Feasibility and acceptability of CD-ROM-based cognitive-behavioural treatment for binge-eating disorder.	European Eating Disorders Review	Included subthreshold ED patients
19	2012	Carrard, I., Van der Linden, M., & Golay, A.	Comparison of obese and nonobese individuals with binge eating disorder: delicate boundary between binge eating disorder and non-purging bulimia nervosa	European Eating Disorders Review	Included subthreshold ED patients
20	2016	Nitsch, M., Dimopoulos, C.N., Flaschberger, E., Saffran, K., Kruger, JF., Garlock, L., Wilfley, D.E., Taylor, C.B., & Jones, M	A Guided Online and Mobile Self-Help Program for Individuals With Eating Disorders: An Iterative Engagement and Usability Study	Journal of Medical Internet Research	Positive screen for ED symptoms. No formal diagnosis

Appendix C: Systematic Review – Summary of quality criteria descriptions

<i>Randomisation</i>	<i>Description (derived from Cochrane Risk of Bias tool)</i>	<i>Points</i>
Well-covered	A good randomisation method was used (e.g. computer generated off-site allocation sequence).	2 points
Adequately addressed	Manual method of randomisation method was used, which may not be entirely free of bias (e.g. coin-flip - Clark and Westerberg, 2009). Often become non-random, are difficult to implement and do not leave an audit trail (Dettori, 2010).	1 point
Poorly addressed	One of the following: -Insufficient information about the sequence generation process to permit judgement of "well-covered" or "adequately addressed". - Non-random approach (e.g. may involve some systematic, non-random approach or judgement).	0 point
<i>Blinding</i>	<i>Description (derived from Cochrane Risk of Bias tool)</i>	<i>Points</i>
Well-covered	One of the following: -Blinding of participants ensured, unlikely blinding could have been broken. -No blinding or incomplete blinding, but review authors judge outcome is not likely to be influenced by lack of blinding (e.g. all participants receive input ultimately).	2 points
Adequately addressed	Adequate blinding of participants - (e.g. participants aware of group allocation, but as both groups receive intervention at delayed time, performance bias is minimised as aware will receive intervention).	1 point
Poorly addressed	One of the following: -Blinding of participants attempted, but likely blinding could have been broken, and outcome likely to be influenced by lack of blinding. -No blinding or incomplete blinding, and the outcome is likely to be influenced by lack of blinding. -The study could have been blinded, but was not. -Unclear justification for not blinding (e.g. blinding was detailed as not possible without justification).	0 point

<i>Quality of Intervention</i>	<i>Description (derived from literature)</i>	<i>Points</i>
Well-covered	E-therapy intervention justified by authors as an evidenced-based treatment for eating disorders according to the research base, clearly reported in the study.	2 points
Adequately addressed	One of the following: -E-therapy intervention adequately justified, however not necessarily with specific reference to research base. -E-therapy intervention broadly based on an evidenced treatment, adjustments made by clinicians based on clinical judgement.	1 point
Poorly addressed	E-therapy intervention not evidenced as an effective treatment of eating disorders.	0 point
<i>Therapist input</i>	<i>Description (derived from literature - Wagner, Aardoom)</i>	<i>Points</i>
Well-covered	One of the following: -Regular input from therapist/coach (e.g. each session) -Tailored input delivered by individual therapist/coach assigned to participant.	2 points
Adequately addressed	Infrequent or variable input from therapist/coach (e.g. not at every session).	1 point
Poorly addressed	Lack of input entirely	0 point
<i>Sample size/Power calculation</i>	<i>Description (derived from CREST)</i>	<i>Points</i>
Well-covered	Power calculation clearly defined, and sample size sufficient for all analyses.	2 points
Adequately addressed	One of the following: -Sample size sufficient for most (but not all) analyses; or was close to the minimum required (within about 10%). -Power analysis reported as sufficient to detect difference between groups.	1 point
Poorly addressed	Sample size was insufficient & not accounted for during analysis.	0 point

Appendix D: Systematic Review – Quality ratings across review papers

Authors	Title	Randomisation of subjects	Blinding subjects to group allocation	Intervention <i>Quality of content</i>	Level of therapist contact	Sample size (reported, sufficient power)	Quality score (/10)
Nevonen et al (2006)	Evaluation of a new Internet-based self-help guide for patients with bulimic symptoms in Sweden.	Adequately addressed <i>Rating rationale:</i> Consecutive eating disorder cases at a specialist unit, and normal control randomly selected from Civic Register - split into 3 groups with equal numbers in each group.	Poorly addressed <i>Rating rationale:</i> Nil blinding, control group only complete measures.	Adequately covered <i>Rating rationale:</i> Broadly based on CBT principles, but not following specific evidenced programme.	Adequately covered <i>Rating rationale:</i> Variable contact from each of 3 coaches.	Not addressed <i>Rating rationale:</i> Nil evidence of sample size calculation. Not possible to identify whether sufficient power.	3
Robinson & Serfaty (2008)	Getting better byte by byte: A pilot randomised controlled trial of email therapy for bulimia nervosa and binge eating disorder.	Well-covered <i>Rating rationale:</i> One of the authors randomised participants using a computer-generated random numbers table to one of three groups.	Adequately addressed <i>Rating rationale:</i> Participants aware of group allocation, but WL group receive face-to-face CBT post 3-months.	Adequately addressed <i>Rating rationale:</i> Although number of sessions evidence-based, model of therapy varied depending on e-therapist and was not standardised. CBT not 'independently verified'.	Well-covered <i>Rating rationale:</i> Twice weekly contact via email.	Adequately addressed <i>Rating rationale:</i> Power calculation clearly defined. High default rate so indicated by authors as underpowered.	7

Authors	Title	Randomisation of subjects	Blinding subjects to group allocation	Intervention <i>Quality of content</i>	Level of therapist contact	Sample size (reported, sufficient power)	Quality score (/10)
Schmidt et al (2008)	Randomised controlled trial of CD-ROM-based cognitive-behavioural self-care for bulimia nervosa.	Well-covered <i>Rating rationale:</i> Clear randomisation sequence (independent study team) prepared by statistician. Block sizes outlined.	Poorly addressed <i>Rating rationale:</i> Participants aware of group allocation - informed about group allocation. No access to computer-based intervention	Adequately addressed <i>Rating rationale:</i> CBT-based techniques (evidence-based) via CR-ROM.	Poorly addressed <i>Rating rationale:</i> Nil therapist contact. Access for individual sessions if required.	Well-covered <i>Rating rationale:</i> Sample size outlined & power calculation completed based on pilot study data.	5

Fernandez-Aranda et al (2009)	Internet-based cognitive-behavioral therapy for bulimia nervosa: a controlled study	Poorly addressed <i>Rating rationale:</i> not randomised when assigning to either group. Consecutively assigned to either the treatment group (IBT) or the control condition (WL).	Poorly addressed <i>Rating rationale:</i> Recognised group allocation by timescales and unclear what treatment received as waitlist.	Adequately addressed <i>Rating rationale:</i> Based on Cognitive-Behavioural Therapy (CBT) concepts.	Adequately addressed <i>Rating rationale:</i> Presence of weekly coach guidance, however not at every session.	Not addressed <i>Rating rationale:</i> Nil power calculation reported.	2
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Authors	Title	Randomisation of subjects	Blinding subjects to group allocation	Intervention <i>Quality of content</i>	Level of therapist contact	Sample size (reported, sufficient power)	Quality score (/10)
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Sanchez-Ortiz et al (2011)	Study 1: A randomized controlled trial of internet-based cognitive-behavioural therapy for bulimia nervosa or related disorders in a student population	Well-covered <i>Rating rationale:</i> Clear randomisation strategy detailed using an independent statistician in the Clinical Trials Unit (CTU). Randomisation codes generated. Treatment assignment codes contained in a computerised randomisation database, concealing the sequence until groups were assigned.	Adequately addressed <i>Rating rationale:</i> Participants aware of treatment allocation by timescales: (immediate start = intervention, delayed start = waitlist), however received intervention - ultimately receive intervention. Authors reported "Maintaining blinding would have been ideal but proved impossible."	Well-covered <i>Rating rationale:</i> iCBT intervention <i>Overcoming Bulimia Online</i> (Williams et al. 1998) is a Cognitive-Behavioural interactive multimedia treatment programme.	Well-covered <i>Rating rationale:</i> Once 1-2 weeks by CBT therapists.	Well-covered <i>Rating rationale:</i> Power calculation outlined based on pilot data. Clear attrition correction factor outlined, with clear attrition to follow-up rate.	9
Sanchez-Ortiz et al (2011)	Study 2: The role of email guidance in internet-based cognitive-behavioural self-care treatment for bulimia nervosa						

Authors	Title	Randomisation of subjects	Blinding subjects to group allocation	Intervention <i>Quality of content</i>	Level of therapist contact	Sample size (reported, sufficient power)	Quality score (/10)
Brockmeyer et al (2014)	Training cognitive flexibility in patients with anorexia nervosa: A pilot randomized controlled trial of cognitive remediation therapy	Well-covered <i>Rating rationale:</i> Group assignment determined by an independent research coordinator, using specific open source randomisation software. Randomisation was stratified by duration of illness in a 1:1 ratio.	Poorly addressed <i>Rating rationale:</i> Blinding of therapists & patients was not possible according to authors.	Well-covered <i>Rating rationale:</i> Evidenced intervention for Anorexia Nervosa - Cognitive Remediation Therapy (CRT) - manualised.	Well-covered <i>Rating rationale:</i> 9x face-to-face sessions delivered over a 3-week period	Poorly addressed <i>Rating rationale:</i> Nil sample size nor power analysis reported.	6

Authors	Title	Randomisation of subjects	Blinding subjects to group allocation	Intervention <i>Quality of content</i>	Level of therapist contact	Sample size (reported, sufficient power)	Quality score (/10)
Ter Huurne et al (2015)	Study 1: Web-Based Cognitive Behavioral Therapy for Female Patients With Eating Disorders: Randomized Controlled Trial.	Well-covered <i>Rating rationale:</i> Clear randomisation strategy undertaken by independent researcher. Computer-generated randomisation with varying block sizes, stratified by type of eating disorder (BN, BED, EDNOS), and using a 1:1 ratio.	Adequately addressed <i>Rating rationale:</i> All participants received intervention, but WL Control to receive at a delayed start (>15 weeks).	Well-covered <i>Rating rationale:</i> Utilised web-based CBT programme developed by multidisciplinary team and Dutch organisation for people with eating disorders.	Well-covered <i>Rating rationale:</i> Twice weekly contact via internet, and telephone support also available on request by participants.	Adequately addressed <i>Rating rationale:</i> Power analysis completed. Sample size reported as 42 participants, half of predetermined sample size (84 participants) required.	8
Ter Huurne et al (2017)	Study 2: Treatment dropout in web-based cognitive behavioral therapy for patients with eating disorders						

Authors	Title	Randomisation of subjects	Blinding subjects to group allocation	Intervention <i>Quality of content</i>	Level of therapist contact	Sample size (reported, sufficient power)	Quality score (/10)
Hogdahl et al (2016)	Personality predicts drop-out from therapist-guided internet-based cognitive behavioural therapy for eating disorders. Results from a randomized controlled trial.	Well-covered <i>Rating rationale:</i> Pocket calculator used to allocate participants randomly to one of 2 types of ICBT.	Well-covered <i>Rating rationale:</i> Participants in both conditions receive online Cognitive Behavioural Therapy (CBT).	Well-covered <i>Rating rationale:</i> CBT-based programmes x2: BIB-ICBT- self-help manual (Fairburn, 2003) Salut BN - pure online program, 7 steps.	Well-covered <i>Rating rationale:</i> Weekly, internet-based therapist support. 2x face-to-face meetings.	Adequately addressed <i>Rating rationale:</i> Nil sample size calculation reported, however insufficient power noted and analysis adjusted accordingly	9
Wagner et al (2016)	Randomized controlled trial of an internet-based cognitive-behavioral treatment program for binge-eating disorder	Well-covered <i>Rating rationale:</i> Participants randomly assigned to group using computer-assisted randomization procedure conducted by the Centre for Clinical Trials & stratified by objective binge eating episodes.	Adequately addressed <i>Rating rationale:</i> Recognised group allocation by timescales (immediate start = intervention, delayed start = waitlist), however received intervention so would minimise expectation.	Adequately addressed: <i>Rating rationale:</i> Intervention based on existing evidence-based cognitive-behavioural face-to-face treatment and self-help programmes for BED and internet-based treatment for BN. CBT supervision provided to therapists.	Well-covered <i>Rating rationale:</i> Intensive therapist guidance. Offer to call or email therapist anytime if distressed/in crisis.	Well-covered <i>Rating rationale:</i> A priori sample size calculations indicated a target sample size of 51 for a medium between-group effects at post-treatment.	8

Authors	Title	Randomisation of subjects	Blinding subjects to group allocation	Intervention <i>Quality of content</i>	Level of therapist contact	Sample size (reported, sufficient power)	Quality score (/10)
Zerwas et al (2016) Watson et al (2016)	Study 1: CBT4BN: A Randomized Controlled Trial of Online Chat and Face-to-Face Group Therapy for Bulimia Nervosa Study 2: Predictors of dropout in face-to-face and internet-based cognitive-behavioral therapy for bulimia nervosa in a randomized controlled trial	Well-covered <i>Rating rationale:</i> Eligible patients were randomly assigned, using central computerized randomization schedule (1:1 ratio, using a permuted block algorithm).	Poorly addressed <i>Rating rationale:</i> ICBT compared to face-to-face group therefore patients aware of group allocation & could impact on engagement.	Well-covered <i>Rating rationale:</i> Manualised cognitive-behavioural therapy (CBT) is the global treatment recommendation for Bulimia Nervosa.	Well-covered <i>Rating rationale:</i> Therapist input at every session.	Well-covered <i>Rating rationale:</i> Conservatively predicted sample, and as study sample exceeded number sufficient power was gained.	8
Strandskov et al (2017)	Effects of Tailored and ACT-Influenced Internet-Based CBT for Eating Disorders and the Relation Between Knowledge	Well-covered <i>Rating rationale:</i> Clear randomisation process lead by an independent researcher (outwith the research group), utilising a web-based generator with complex algorithm for	Adequately addressed <i>Rating rationale:</i> All participants received the intervention, but waitlist control group started after	Adequately addressed <i>Rating rationale:</i> Combination of evidenced-based CBT and ACT manuals for treating eating disorders.	Adequately addressed <i>Rating rationale:</i> Individual therapist allocated and provided daily support, however "as-and-when"	Well-covered <i>Rating rationale:</i> Authors referred to power analysis being large enough to detect differences between groups.	7

	Acquisition and Outcome: A Randomized Controlled Trial	randomisation.	treatment group ended (parity of input).		approach could result in some not receiving any therapist contact.		
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Appendix E: Empirical paper - author guidelines for Clinical Psychology & Psychotherapy

AUTHOR GUIDELINES

Sections

1. Submission
2. Aims and Scope
3. Preparing the Submission
4. Editorial Policies and Ethical Considerations
5. Author Licensing
6. Publication Process After Acceptance
7. Post Publication

1. SUBMISSION

Authors should kindly note that submission implies that the content has not been published or submitted for publication elsewhere except as a brief abstract in the proceedings of a meeting or symposium.

Once the submission materials have been prepared in accordance with the Author Guidelines, manuscripts should be submitted online at <http://mc.manuscriptcentral.com/cpp>.

The submission system will prompt you to use an ORCID (a unique author identifier) to help distinguish your work from that of other researchers. Click here to find out more.

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Initial Submission

NON-LATEX USERS: Upload your manuscript files. At this stage, further source files do not need to be uploaded.

LATEX USERS: For reviewing purposes you should upload a single .pdf that you have generated from your source files. You must use the File Designation "Main Document" from the dropdown box.

Revision Submission

NON-LATEX USERS: Editable source files must be uploaded at this stage. Tables must be on separate pages after the reference list, and not be incorporated into the main text. Figures should be uploaded as separate figure files.

LATEX USERS: When submitting your revision you must still upload a single .pdf that you have generated from your now revised source files. You must use the File Designation "Main Document" from the dropdown box. In addition you must upload your TeX source files. For all your source files you must use the File Designation "Supplemental Material not for review". Previous versions of uploaded documents must be deleted. If your manuscript is accepted for publication we will use the files you upload to typeset your article within a totally digital workflow.

2. AIMS AND SCOPE

Clinical Psychology & Psychotherapy aims to keep clinical psychologists and psychotherapists up to date with new developments in their fields. The Journal will provide an integrative impetus both between theory and practice and between different orientations within clinical psychology and

psychotherapy. Clinical Psychology & Psychotherapy will be a forum in which practitioners can present their wealth of expertise and innovations in order to make these available to a wider audience. Equally, the Journal will contain reports from researchers who want to address a larger clinical audience with clinically relevant issues and clinically valid research. The journal is primarily focused on clinical studies of clinical populations and therefore no longer normally accepts student-based studies.

This is a journal for those who want to inform and be informed about the challenging field of clinical psychology and psychotherapy.

3. PREPARING THE SUBMISSION

Parts of the Manuscript

The manuscript should be submitted in separate files: title page; main text file; figures.

Title Page

The title page should contain:

1. A short informative title containing the major key words. The title should not contain abbreviations (see Wiley's best practice SEO tips);
2. A short running title of less than 40 characters;
3. The full names of the authors;
4. The author's institutional affiliations where the work was conducted, with a footnote for the author's present address if different from where the work was conducted;
5. Conflict of Interest statement;
6. Acknowledgments.

Authorship

Please refer to the journal's Authorship policy in the Editorial Policies and Ethical Considerations section for details on author listing eligibility.

Acknowledgments

Contributions from anyone who does not meet the criteria for authorship should be listed, with permission from the contributor, in an Acknowledgments section. Financial and material support should also be mentioned. Thanks to anonymous reviewers are not appropriate.

Conflict of Interest Statement

Authors will be asked to provide a conflict of interest statement during the submission process. For details on what to include in this section, see the Conflict of Interest section in the Editorial Policies and Ethical Considerations section below. Submitting authors should ensure they liaise with all co-authors to confirm agreement with the final statement.

Main Text File

As papers are double-blind peer reviewed, the main text file should not include any information that might identify the authors. The main text file should be presented in the following order:

1. Title, abstract, and key words;
2. Main text;
3. References;
4. Tables (each table complete with title and footnotes);
5. Figure legends;
6. Appendices (if relevant).

Figures and supporting information should be supplied as separate files.

Abstract

Enter an abstract of up to 150 words for all articles. An abstract is a concise summary of the whole

paper, not just the conclusions, and is understandable without reference to the rest of the paper. It should contain no citation to other published work

Keywords

Please provide five to six keywords (see [Wiley's best practice SEO tips](#)).

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The language of the journal is English. 12-point type in one of the standard fonts: Times, Helvetica, or Courier is preferred. Please double-line space your manuscript. Tables must be on separate pages after the reference list, and not be incorporated into the main text. Figures should be uploaded as separate figure files

References

References should be prepared according to the Publication Manual of the American Psychological Association (6th edition). This means in text citations should follow the author-date method whereby the author's last name and the year of publication for the source should appear in the text, for example, (Jones, 1998). The complete reference list should appear alphabetically by name at the end of the paper. Please note that for journal articles, issue numbers are not included unless each issue in the volume begins with page 1, and a DOI should be provided for all references where available.

For more information about APA referencing style, please refer to the APA FAQ.

Reference examples follow:

Journal article

Beers, S. R. , & De Bellis, M. D. (2002). Neuropsychological function in children with maltreatment-related posttraumatic stress disorder. *The American Journal of Psychiatry*, 159, 483–486.

doi:10.1176/appi.ajp.159.3.483

Book

Bradley-Johnson, S. (1994). *Psychoeducational assessment of students who are visually impaired or blind: Infancy through high school* (2nd ed.). Austin, TX: Pro-ed.

Internet Document

Norton, R. (2006, November 4). How to train a cat to operate a light switch [Video file]. Retrieved from <http://www.youtube.com/watch?v=Vja83KLQXZs>

Tables

Tables should be self-contained and complement, not duplicate, information contained in the text. They should be supplied as editable files, not pasted as images. Legends should be concise but comprehensive – the table, legend, and footnotes must be understandable without reference to the text. All abbreviations must be defined in footnotes. Footnote symbols: †, ‡, §, ¶, should be used (in that order) and *, **, *** should be reserved for P-values. Statistical measures such as SD or SEM should be identified in the headings.

Figure Legends

Legends should be concise but comprehensive – the figure and its legend must be understandable without reference to the text. Include definitions of any symbols used and define/explain all abbreviations and units of measurement.

Figures

Although authors are encouraged to send the highest-quality figures possible, for peer-review purposes, a wide variety of formats, sizes, and resolutions are accepted. Click [here](#) for the basic figure

requirements for figures submitted with manuscripts for initial peer review, as well as the more detailed post-acceptance figure requirements.

Figures submitted in colour may be reproduced in colour online free of charge. Please note, however, that it is preferable that line figures (e.g. graphs and charts) are supplied in black and white so that they are legible if printed by a reader in black and white. The cost of printing colour illustrations in the journal will be charged to the author. The cost is £150 for the first figure and £50 for each figure thereafter. If colour illustrations are supplied electronically in either TIFF or EPS format, they may be used in the PDF of the article at no cost to the author, even if this illustration was printed in black and white in the journal. The PDF will appear on the Wiley Online Library site.

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Appendices will be published after the references. For submission they should be supplied as separate files but referred to in the text.

Supporting Information

Supporting information is information that is not essential to the article, but provides greater depth and background. It is hosted online and appears without editing or typesetting. It may include tables, figures, videos, datasets, etc.

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Note: if data, scripts, or other artefacts used to generate the analyses presented in the paper are available via a publicly available data repository, authors should include a reference to the location of the material within their paper.

General Style Points

The following points provide general advice on formatting and style.

- **Abbreviations:** In general, terms should not be abbreviated unless they are used repeatedly and the abbreviation is helpful to the reader. Initially, use the word in full, followed by the abbreviation in parentheses. Thereafter use the abbreviation only.
- **Units of measurement:** Measurements should be given in SI or SI-derived units. Visit the Bureau International des Poids et Mesures (BIPM) website for more information about SI units.
- **Numbers:** numbers under 10 are spelled out, except for: measurements with a unit (8mmol/l); age (6 weeks old), or lists with other numbers (11 dogs, 9 cats, 4 gerbils).
- **Trade Names:** Chemical substances should be referred to by the generic name only. Trade names should not be used. Drugs should be referred to by their generic names. If proprietary drugs have been used in the study, refer to these by their generic name, mentioning the proprietary name and the name and location of the manufacturer in parentheses.

Wiley Author Resources

Manuscript Preparation Tips: Wiley has a range of resources for authors preparing manuscripts for submission available [here](#). In particular, authors may benefit from referring to Wiley's best practice tips on Writing for Search Engine Optimization.

Editing, Translation, and Formatting Support: Wiley Editing Services can greatly improve the chances of a manuscript being accepted. Offering expert help in English language editing, translation, manuscript formatting, and figure preparation, Wiley Editing Services ensures that the manuscript is ready for submission.

4. EDITORIAL POLICIES AND ETHICAL CONSIDERATIONS

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The acceptance criteria for all papers are the quality and originality of the research and its significance to journal readership. Except where otherwise stated, manuscripts are double-blind peer reviewed. Papers will only be sent to review if the Editor-in-Chief determines that the paper meets the appropriate quality and relevance requirements.

Wiley's policy on the confidentiality of the review process is available [here](#).

Data Sharing and Data Accessibility

The journal encourages authors to share the data and other artefacts supporting the results in the paper by archiving it in an appropriate public repository. Authors should include a data accessibility statement, including a link to the repository they have used, in order that this statement can be published alongside their paper.

Human Studies and Subjects

For manuscripts reporting studies that involve human participants, a statement identifying the ethics committee that approved the study and confirmation that the study conforms to recognized standards is required, for example: Declaration of Helsinki; US Federal Policy for the Protection of Human Subjects; or European Medicines Agency Guidelines for Good Clinical Practice. It should also state clearly in the text that all persons gave their informed consent prior to their inclusion in the study. Patient anonymity should be preserved. Photographs need to be cropped sufficiently to prevent human subjects being recognized (or an eye bar should be used). Images and information from individual participants will only be published where the authors have obtained the individual's free prior informed consent. Authors do not need to provide a copy of the consent form to the publisher; however, in signing the author license to publish, authors are required to confirm that consent has been obtained. Wiley has a standard patient consent form available for use.

Clinical Trial Registration

The journal requires that clinical trials are prospectively registered in a publicly accessible database and clinical trial registration numbers should be included in all papers that report their results. Authors are asked to include the name of the trial register and the clinical trial registration number at the end of the abstract. If the trial is not registered, or was registered retrospectively, the reasons for this should be explained.

Research Reporting Guidelines

Accurate and complete reporting enables readers to fully appraise research, replicate it, and use it.

Authors are encouraged to adhere to recognised research reporting standards. The EQUATOR

Network collects more than 370 reporting guidelines for many study types, including for:

- Randomised trials: CONSORT
- Observational studies: STROBE
- Systematic reviews: PRISMA
- Case reports: CARE
- Qualitative research: SRQR
- Diagnostic / prognostic studies: STARD
- Quality improvement studies: SQUIRE
- Economic evaluations: CHEERS
- Animal pre-clinical studies: ARRIVE
- Study protocols: SPIRIT
- Clinical practice guidelines: AGREE

We also encourage authors to refer to and follow guidelines from:

- Future of Research Communications and e-Scholarship (FORCE11)
- National Research Council's Institute for Laboratory Animal Research guidelines
- The Gold Standard Publication Checklist from Hooijmans and colleagues
- Minimum Information Guidelines from Diverse Bioscience Communities (MIBBI) website
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Conflict of Interest

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2. Been involved in drafting the manuscript or revising it critically for important intellectual content;
3. Given final approval of the version to be published. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content; and
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Appendix F: Empirical Project – East of Scotland REC - IRAS approval letter



East of Scotland Research Ethics Service (*EoSRES*)

Research Ethics Service

Tayside medical Science Centre
Residency Block Level 3
George Pirie Way
Ninewells Hospital and Medical School
Dundee DD1 9SY

Miss Eleanor Filgate
NHS Tayside Psychological Therapies Service
7 Dudhope Terrace
Dundee
DD3 6HH

Date: 27 April 2016
Your Ref:
Our Ref: LR/16/ES/0014
Enquiries to: Mrs Lorraine Reilly
Direct Line: 01382 383878
Email: eosres.tayside@nhs.net

Dear Miss Filgate

Study Title: The effectiveness and acceptability of the internet-based "Smart Eating" self-help programme alongside treatment as usual (TAU) for the management of eating disorders: a pilot study.

REC reference number: 16/ES/0014

IRAS project ID 163177

Thank you for your email of 26 April 2016. I can confirm the REC has received the documents listed below and that these comply with the approval conditions detailed in our letter dated 19 April 2016

Documents received

The documents received were as follows:

Document	Version	Date
Response to Additional Conditions Met		26 April 2016

Approved documents

The final list of approved documentation for the study is therefore as follows:

Document	Version	Date
Covering letter on headed paper [Response to original provisional opinion letter]	v2	18 March 2016
Covering letter on headed paper [Response to opinion letter - v2]	v2	31 March 2016
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Sponsor insurance]		01 August 2015
GP/consultant information sheets or letters	v1	20 December 2015
Interview schedules or topic guides for participants		

Interview schedules or topic guides for participants [Smart Eating Client profile template]		
IRAS Checklist XML [Checklist_08042016]		08 April 2016
Non-validated questionnaire [Feedback questionnaire]	v2	04 March 2016
Participant consent form [Initial consent form]	v1	20 December 2015
Participant consent form [Smart Eating Information sheet and consent]		30 October 2015
Participant consent form [Smart Eating consent form (piloting already in Asia)]	v2	16 March 2016
Participant consent form [Full consent form]	v3	31 March 2016
Participant information sheet (PIS) [Smart Eating participant information sheet (piloting in Asia already)]	v2	16 March 2016
Participant information sheet (PIS) [UK participant information sheet]	v3	31 March 2016
REC Application Form [REC_Form_18032016]		18 March 2016
Research protocol or project proposal	v1	20 December 2015
Response to Additional Conditions Met		26 April 2016
Summary CV for Chief Investigator (CI)		
Summary CV for supervisor (student research)		
Validated questionnaire [Beck Anxiety Inventory]		18 January 2016
Validated questionnaire [Beck Depression Inventory]		18 January 2016
Validated questionnaire [EDE-Q]		18 January 2016
Validated questionnaire [MSCARED]		18 January 2016
Validated questionnaire [SF-36]		18 January 2016
Validated questionnaire [SCOFF Screening tool]		18 January 2016
Validated questionnaire [EDI-3]	v2	04 March 2016

You should ensure that the sponsor has a copy of the final documentation for the study. It is the sponsor's responsibility to ensure that the documentation is made available to R&D offices at all participating sites.

16/ES/0014

Please quote this number on all correspondence

Yours sincerely



Mrs Lorraine Reilly
Senior REC Co-ordinator

E-mail: eosres.tayside@nhs.net

Copy to: Mrs Jo-Anne Robertson
NHS Tayside R&D Office

Appendix G: Empirical Project – NHS Tayside R&D approval



27 April 2016

Miss Eleanor Filgate
NHS Tayside
NHS Tayside Psychological Therapies Services
7 Dudhope Terrace
DUNDEE
DD3 6HH

Dear Miss Filgate,

R&D MANAGEMENT APPROVAL – TAYSIDE

Title: The effectiveness and acceptability of the internet-based "Smart Eating" self-help programme alongside treatment as usual (TAU) for the management of eating disorders: a pilot study.

Chief Investigator: Miss Eleanor Filgate

Principal Investigator/Local Collaborator: Dr Paula Collin

Tayside Ref: 2015MH19 **NRS Ref:** n/a

REC Ref: 16/ES/0014

Sponsor: University of Edinburgh

Funder: no external funder

Many thanks for your application to carry out the above project here in NHS Tayside. I am pleased to confirm that the project documentation (as outlined below) has been reviewed, registered and Management Approval has been granted for the study to proceed locally in Tayside.

Approval is granted on the following conditions:-

- ALL Research must be carried out in compliance with the Research Governance Framework for Health & Community Care, Health & Safety Regulations, data protection principles, statutory legislation and in accordance with Good Clinical Practice (GCP).
 - All amendments to be notified to TASC R&D Office via the correct amendment pathway. Either direct to the R&D Office or via the Lead Co-ordinating Centre depending on how the study is set up (<http://www.hra.nhs.uk/nhshsc-rd-uk-process-management-amendments/>).
 - All local researchers must hold either a Substantive Contract, Honorary Research Contract, Honorary Clinical Contract or Letter of Access with NHS Tayside where required (<http://www.nihr.ac.uk/policy-and-standards/research-passports.htm>).
 - TASC R&D Office to be informed of change in Principal Investigator, Chief Investigator or any additional research personnel locally.
-
- Notification to TASC R&D Office of any change in funding.
 - As custodian of the information collated during this research project you are responsible for ensuring the security of all personal information collected in line with NHS Scotland IT Security Policies, until destruction of this data.
 - All eligible and adopted studies will be added to the UKCRN Portfolio database <http://public.ukcrn.org.uk/>. Recruitment figures for eligible and adopted studies must be recorded onto the Portfolio every month. This is the responsibility of the lead UK site. If you are the lead, or only UK site, we can provide help or advice with this. For information, contact Sarah Kennedy (01382 383882 or sarah.kennedy17@nhs.net) or Margaret Marshall (01382 383091 or margaret.marshall7@nhs.net).
 - Annual reports are required to be submitted to TASC R&D Office with the first report due 12 months from date of issue of this management approval letter and at yearly intervals until completion of the study.
 - Notification of early termination within 15 days or End of Trial within 90 days followed by End of Trial Report within 1 year to TASC R&D Office.
 - You may be required to assist with and provide information in regard to audit and monitoring of study.

Please note you are required to adhere to the conditions, if not, NHS management approval may be withdrawn for the study.

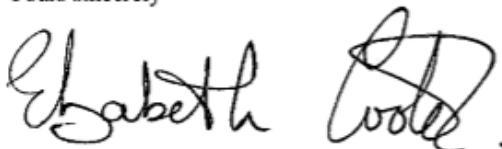
Approved Documents

Document	Version	Date
GP Letter	1	20/12/15
Topic guides for participants		
Topic guides for participants (smart eating client profile template)		
Feedback questionnaire	2	04/03/16
Participant consent form (initial consent form)	1	20/12/15
Participant consent form (smart eating information sheet and consent)		30/10/15
Participant consent form (smart eating consent form (piloting already in Asia)	2	16/03/16
Participant consent form (full consent form)	3	31/03/16
Participant information sheet (smart eating participant information sheet (piloting in Asia already)	2	16/03/16
Participant information sheet (UK participant information sheet)	3	31/03/16
Research Protocol	1	20/12/15
Summary CV for Chief Investigator		
Summary CV for supervisor (student research)		
SCOFF screening tool		18/01/16

May I take this opportunity to wish you every success with your project.

Please do not hesitate to contact TASC R&D Office should you require further assistance.

Yours sincerely



Elizabeth Coote
Head of Non-Commercial Research Services

TAyside medical Science Centre (TASC)
Ninewells Hospital & Medical School
TASC Research & Development Office
Residency Block, Level 3
George Pirie Way
Dundee DD1 9SY
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c.c.

paula.collin@nhs.net
Margaret.marshall7@nhs.net
Tascfeasibility.tayside@nhs.net

Appendix H: Empirical Project – Patient Initial Consent Form

Version 1.
Date: 20.12.15
Eating disorders: online self-help & usual treatment (TAU) vs TAU only



INITIAL CONSENT FOR CONTACT

NAME.....

CONTACT NUMBER.....

EMAIL ADDRESS.....

I hereby provide initial consent for contact by the Chief Investigator in relation to the study: "The Effectiveness and Acceptability of an Online Self-help Programme for the Management of Eating Disorders", in order to give me more information on the project and answer questions I may have.

I understand this is not full consent for study involvement, but solely for the purposes of initial contact from the Chief Investigator

SIGNATURE.....

DATE:.....

Please tick one of the following:

I would prefer to be contacted by email ☐

I would prefer to be contacted by telephone ☐

I don't mind how you contact me ☐

Many thanks,

*Chief Investigator, Eleanor Filgate
NHS Tayside*

Appendix I: Empirical Project – Patient Full Consent Form

Version 3.
Date: 31.03.16
Eating disorders: online self-help & usual treatment (TAU) vs TAU only



INFORMED CONSENT FORM

Title of Study: The Acceptability and Effectiveness of an Online Self-help Programme for the Management of Eating Disorders

Name of Chief Investigator: Eleanor (Nell) Filgate, Trainee Clinical Psychologist, NHS Tayside

Please initial box –

1	I confirm that I have read and understood the Participant Information Sheet (Version 3, 31.03.16) for the above-named study. I have had the opportunity to consider the information and ask questions, and have had any questions answered satisfactorily.	
2a	I understand that my participation is voluntary and that I am free to withdraw at any time, without giving any reason, and without any medical care or legal rights being affected.	
2b	I understand that if I lose capacity, I, and all of my identifiable data, will be withdrawn from the study, however, the research team will retain all of my non-identifiable data.	
3	I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from the regulatory authorities and from the Sponsor (University of Edinburgh) or from the/other NHS Board(s) where it is relevant to my taking part in this research.	
4	I give permission for the Chief Investigator (Eleanor Filgate) to have access to my medical records and study data, and if required to share with those outlined in Statement 3 for ongoing study monitoring and audit purposes.	
5	I agree to my GP being informed of my participation in the study.	
6	I agree to participate in the above-named study.	

Name of participant _____

Date _____

Signature _____

Name of individual taking consent _____

Date _____

Signature _____

Tick here if you would like to receive a copy of the published study findings ☐

(1 original- participant, 1 original- medical records, 1 copy - study file)

Appendix J: Empirical Project – Patient Participant Information Sheet

Version 3.
Date: 31.03.16
Eating disorders: online self-help & usual treatment (TAU) vs TAU only



PARTICIPANT INFORMATION SHEET

The Acceptability and Effectiveness of an Online Self-help Programme for the Management of Eating Disorders

INVITATION

My name is Eleanor Filgate and I am required to undertake a project as part of my course and invite you to take part in the following study. However, before you decide to do so, I need to be sure that you understand firstly why I am doing it, and secondly what it would involve if you agreed. I am therefore providing you with the following information. Please read it carefully and be sure to ask any questions you might have and, if you want, discuss it with others including friends and family. I will do my best to explain the project to you and provide you with any further information you may ask for now or later.

Please note that you do not have to make an immediate decision about participating in the study, and that you can take the information away before you decide.

Background to the study

“Smart Eating” is an online self-help programme for the management of eating disorders that has been designed on Cognitive Behavioural Therapy principles. It has been found to improve motivation for change, eating disorder symptoms and quality of life in Asian and Australian patients. The programme is in the piloting stage so is under ongoing evaluation. To date, there has been no UK study of the benefits to be gained in using the “Smart Eating” programme as part of standard eating disorder outpatient treatment.

Purpose of the study

The purpose of this study is to evaluate the acceptability and effectiveness of “Smart Eating” when used as part of treatment for adult patients under the care of NHS Tayside Eating Disorders Service. If the “Smart Eating” programme is found to be helpful, the study may help to inform future treatment developments within eating disorders services.

Why have I been asked to participate in the study?

You have been asked to participate in the study as an adult patient under the care of NHS Tayside Eating Disorders Service.

Do I have to participate in the study?

Why have I been asked to participate in the study?

You have been asked to participate in the study as an adult patient under the care of NHS Tayside Eating Disorders Service.

Do I have to participate in the study?

No, you do not have to participate in the study. We will provide you with information, and do our best to answer any questions you may have, but it is entirely your decision as to whether to participate. **You are free to decline to participate in the study, or to withdraw from it at any time without reason and without this affecting your medical care or legal rights.**

What will participation in the study involve?

If, having read this Participant Information sheet you are interested in participating in the study, you will be asked to complete an Initial Consent for Contact Form with basic contact information (name, telephone number, email address), which you should hand back to your therapist in the NHS Tayside Eating Disorders Service. Following this (24+hours later), you will be contacted by the Chief Investigator (Eleanor Filgate) via email or telephone (whichever you prefer), offering you an

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Version 3
Date: 31.03.16
Eating disorders: online self-help & usual treatment (TAU) vs TAU only



opportunity to ask any further questions you may have relating to the study. If at this point you are still interested in study involvement, you will be asked to complete a full consent form – this will be given in your next session with the NHS Tayside Eating Disorders Service. Following this, you will be emailed step-by-step instructions of what to do next.

At this stage, you will be assigned to a group in a randomised fashion; where you have equal chance of being in either group 1 (treatment as usual only) or group 2 (treatment as usual + “Smart Eating” self-help programme). Further group details are below.

Group 1: Treatment as usual (TAU) from NHS Tayside Eating Disorders Service

If you are allocated to this group you will receive TAU (i.e., whatever treatment deemed appropriate by your clinician as part of your routine care). You will be asked to complete a small number of questionnaires on four occasions over an approximately six-month period via the “Smart Eating” programme website. Once the study is finished, you will be able to access the entire “Smart Eating” programme.

Group 2: Treatment as usual (TAU) plus the “Smart Eating” programme

If you are allocated to this group you will receive TAU, (i.e., whatever treatment deemed appropriate by your clinician as part of your routine care), **and** you will be given access to the full “Smart Eating” programme. The programme comprises several components and can be completed in approximately three months. You will also be asked to complete a small number of questionnaires on four occasions over an approximately six-month period.

Your family member(s) can register to access information via the “Introduction” page on the “Smart Eating” programme website. With additional information your family can play a supportive role in your treatment for an eating disorder, which research shows can help support positive outcomes.

To note: Your NHS Tayside Eating Disorders clinician will know you are involved in this study, but they will **not** know which group you are in.

Do I need much experience of using a computer to participate in the study?

Completion of the “Smart Eating” programme requires basic computer skills, and you will need regular access to a computer, in a quiet/private environment, for the duration of the study.

What will happen if I decide to withdraw from the study?

Participation in the study is entirely voluntary, and you are free to withdraw from it at any time without reason and without this affecting your medical care/legal rights.

Will my participation in the study be confidential?

Yes, all the details you provide as part of the study will be confidential, and any personal information given in questionnaires will be anonymised. You will be asked to indicate on a form whether you consent to your GP being informed of your participation. The Chief Investigator will access your NHS medical records to update that you are involved in this study so that people involved in your care are aware. The Chief Investigator will also gain basic information on input you have from the NHS Tayside Eating Disorders Service (e.g. how long you have been receiving treatment as usual).

If, during the study, you indicate that you or another person are/is at risk of harm (e.g., you feel suicidal), confidentiality will have to be broken, and your clinician will have to be informed so that appropriate support can be provided.

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Version 3.
Date: 31.03.16
Eating disorders: online self-help & usual treatment (TAU) vs TAU only

**Who has access to my information if I participate in the study?**

The Smart Eating programme was developed by our partner, Dr Sau Fong Leung (Eating Disorder Nurse and Assistant Professor) at The Hong Kong Polytechnic University. Dr Leung and her team may access your questionnaire information during or at the end of your study involvement. However, they will not know it is you (your identity is anonymous to their team). The only person who is aware of which questionnaire information belongs to whom is the Chief Investigator (Eleanor Filgate) and her Clinical Supervisor, Dr Paula Collin (contact details below).

Who has organised the research?

The study is written for the Chief Investigator's submission as part fulfilment of her Doctorate in Clinical Psychology qualification at the University of Edinburgh. The study is sponsored by the University of Edinburgh, who in this role are responsible for the overall management of the study and providing insurance and indemnity.

Who has reviewed the study?

The East of Scotland Research Ethics Service REC 2, which has responsibility for scrutinising all proposals for medical research on humans, has examined the proposal and has raised no objections from the point of view of research ethics. It is a requirement that your records in this research, together with any relevant medical records, be made available for scrutiny by monitors from the Sponsor (University of Edinburgh) and NHS Tayside, whose role is to check that research is properly conducted and the interests of those taking part are adequately protected. NHS management approval has also been obtained.

Are there any benefits associated with participating in the study?

Participants in the study who receive standard outpatient treatment **plus** "Smart Eating" may benefit from improved motivation for change, eating disorder symptoms and quality of life, as demonstrated in previous studies of the "Smart Eating" programme. If the study demonstrates such improvements then it is hoped that others may benefit from receiving the full "Smart Eating" programme alongside individual NHS Tayside Eating Disorders Service input as routine treatment.

Are there any risks associated with participating in the study?

Due to the nature of the study, the potential risks to participants are minimal. None of the published studies of "Smart Eating" has documented any risks or adverse effects associated with the programme. Similarly, all of the questionnaires completed as part of the study have been used extensively in eating disorder research and clinical practice without any documented risks or adverse effects.

Where will I get further information about the study?

You can visit the Smart Eating programme website if you wish for further information. There you can find the UK Participant Information Sheet (this form) and UK full consent form, along with the information and consent forms Hong Kong Smart Eating project that is already underway. You can also contact The Chief Investigator with any questions you may have about study involvement (see contact details below).

What should I do if I encounter any difficulties while participating in the study or if you would like to withdraw from the study?

If you encounter any difficulties while participating in the study or if you wish to withdraw from the study, you should contact the Chief Investigator (see "Contact details" below).

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Version 3.
Date: 31.03.16
Eating disorders: online self-help & usual treatment (TAU) vs TAU only



If you have concerns about any aspect of the study, or the way you have been treated, you may wish to speak to an independent clinician for advice (details below):

Dr Ailie Castle, Clinical Psychologist & Local NHS Psychology Tutor, NHS Tayside
ailie.castle@nhs.net

If you wish to make a formal complaint, you should contact the following:

Complaints and Feedback Team Lead
Complaints and Feedback Team
Level 7
Ninewells Hospital
Dundee DD1 9SY
Freephone: 0800 027 5507
Email: feedback.Tayside@nhs.net

What will happen when the study ends?

During and on completion of the study, you will receive treatment as usual, i.e., whatever treatment deemed appropriate by your clinician as part of your routine care. You will continue to have access to the "Smart Eating" programme if you wish. You will be advised by a member of the research team of any changes in your symptoms over the course of the study, as measured by the questionnaires you complete.

What will happen to the results of the study?

The study will be written up as a thesis project, along with a systematic review of relevant literature as part fulfilment of the Chief Investigator's Doctorate in Clinical Psychology qualification at the University of Edinburgh. If you would like to receive a copy of the published study results please select the option on the full consent form.

The study results will be submitted to a peer-reviewed journal for consideration regarding publication. The study results may inform a conference presentation to share findings with other health professionals.

To note, you will **not** be identifiable in any published results.

THANK YOU FOR TAKING THE TIME TO READ THIS INFORMATION

CONTACT DETAILS

Should you wish to discuss any aspect of the study, please contact either:

- Eleanor (Nell) Filgate (Chief Investigator) eleanor.filgate@nhs.net
- Paula Collin (Consultant Clinical Psychologist)
NHS Tayside Eating Disorders Service
4 Dudhope Terrace
Dundee DD3 6HG
01382 306160
eatingdisorders.tayside@nhs.net

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Appendix K: Empirical Project – Study 1: Smart Eating programme guide

"Smart Eating" programme guide to registration

1. Go to the website www.smart-eating.com & click on "Member Registration":



2. Click on the SCOFF questionnaire on the "Member registration" page:

- Complete the SCOFF questionnaire and click "Submit". Make a note of your score, you will need this for member registration:

The screenshot shows the SMART EATING Healthy Eating website. On the left is a green sidebar with a list of links: Introduction, Healthy eating, Family education, Health assessment, Links and resources, and Recovery stories. The main content area has a purple header with 'Member Login', 'Password', and 'Forgot Password' links, along with a 'Member Registration' link. Below the header are several buttons: 'Healthy Diet', 'Dietary Requirement and Assessment', 'Daily Energy Needs', 'Weight Management', 'Eating Disorders', 'Eating Questionnaires', and 'Self-help Programme'. The 'Eating Questionnaires' button is highlighted. Below this, the text reads: 'The following two questionnaires can be used to screen eating disorders and to identify the severity of aspects of psychopathology of eating disorders.' A green box contains the text: 'The SCOFF questionnaire is a new screening tool for eating disorders. It contains 5 questions addressing some features of anorexia nervosa and bulimia nervosa. Every (Yes) response contributes to one point and a score of 2 or above indicates a high risk of having anorexia nervosa or bulimia. Please complete the SCOFF questionnaire and check your test score.' Below this is a 'Start' button. The 'The SCOFF Screening Tool' section contains a table with 5 questions and two columns for 'Yes' and 'No' responses.

	Yes	No
1. Do you make yourself sick (vomit) because you feel uncomfortably full?	<input type="radio"/>	<input type="radio"/>
2. Do you worry you have lost control over how much you eat?	<input type="radio"/>	<input type="radio"/>
3. Have you recently lost more than 6.35 kg / 14 pounds in a 3-month period?	<input type="radio"/>	<input type="radio"/>
4. Do you believe yourself to be fat when others say you are too thin?	<input type="radio"/>	<input type="radio"/>
5. Would you say that food dominates your life?	<input type="radio"/>	<input type="radio"/>

Submit

- Complete the Eating Questionnaire and click "Submit". Make a note of your score, you will need this for member registration:

The screenshot shows the SMART EATING Healthy Eating website. On the left is a green sidebar with a list of links: Introduction, Healthy eating, Family education, Health assessment, Links and resources, and Recovery stories. The main content area has a purple header with 'Member Login', 'Password', and 'Forgot Password' links, along with a 'Member Registration' link. Below the header are several buttons: 'Healthy Diet', 'Dietary Requirement and Assessment', 'Daily Energy Needs', 'Weight Management', 'Eating Disorders', 'Eating Questionnaires', and 'Self-help Programme'. The 'Eating Questionnaires' button is highlighted. Below this, the text reads: 'The following two questionnaires can be used to screen eating disorders and to identify the severity of aspects of psychopathology of eating disorders.' A green box contains the text: 'The SCOFF questionnaire is a new screening tool for eating disorders. It contains 5 questions addressing some features of anorexia nervosa and bulimia nervosa. Every (Yes) response contributes to one point and a score of 2 or above indicates a high risk of having anorexia nervosa or bulimia. Please complete the SCOFF questionnaire and check your test score.' Below this is a 'Start' button. The 'The SCOFF Screening Tool' section contains a table with 5 questions and two columns for 'Yes' and 'No' responses.

EATING QUESTIONNAIRE

Instructions:
The following questions are concerned with the past four weeks (28 days) only.
Please read each question carefully.
Please answer all of the questions. Thank you.

Question 1 to 12: Please select the appropriate answer. Remember that the questions only refer to the past four weeks (28 days) only.

On how many of the past 28 days

1. Have you been deliberately trying to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?

☐ No days ☐ 1-5 days ☐ 6-12 days ☐ 13-15 days ☐ 16-22 days ☐ 23-27 days ☐ Every day

2. Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?

☐ No days ☐ 1-5 days ☐ 6-12 days ☐ 13-15 days ☐ 16-22 days ☐ 23-27 days ☐ Every day

3. Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?

☐ No days ☐ 1-5 days ☐ 6-12 days ☐ 13-15 days ☐ 16-22 days ☐ 23-27 days ☐ Every day

- Click on "Member registration" at the top right-hand corner of the page & this will take you back to the registration page:

- Enter your SCOFF score and Eating Disorder Examination questionnaire scores:

- Complete the rest of "Member Registration" with your details (using your unique login name provided to you. You can set your own password). Please also use the first and second name provided to you, not your actual name.

You will be emailed once your registration has been confirmed - this may take up to 48hours

**Once registered, you can access the programme at your leisure.
You will receive regular reminders to complete the ongoing health assessments.**

Appendix L: Empirical Project – Feedback questionnaire

Evaluation of the "Smart Eating" programme

This short questionnaire gives you an opportunity to express your opinion about the "Smart Eating" self-help programme. Your responses will help us understand whether you found the programme useful or not, and also to gather information on how to improve the user experience of the programme.

1. What are the benefits of using the "Smart Eating" self-help programme?
(e.g. on your eating disorder/physical health/ psychological health)

2. What are the challenges of using the "Smart Eating" self-help programme?

3. What are your suggestions for overall improvements to the "Smart Eating" self-help programme?
(e.g. content, accessibility, design)

4. Was the programme:

- | | | |
|-------------------------------------------------------------------------------|------------------------------|-----------------------------|
| <input type="checkbox"/> user-friendly? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> useful? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| <input type="checkbox"/> accessible on the go (e.g. on your mobile or tablet) | <input type="checkbox"/> Yes | <input type="checkbox"/> No |

Any further comments:

5. If you discontinued using the "Smart Eating" programme, please specify all your reason(s) why:

- | | |
|----------------------------------------------------------|----------------------------------------------------------------------|
| No access to computer <input type="checkbox"/> | Technical difficulties <input type="checkbox"/> |
| Programme not user-friendly <input type="checkbox"/> | Loss of interest in the programme <input type="checkbox"/> |
| Lack of benefit <input type="checkbox"/> | Lack of motivation to work on the programme <input type="checkbox"/> |
| Already in specialist treatment <input type="checkbox"/> | Limited time <input type="checkbox"/> |

Other (please specify):

****Thank you very much for completing this questionnaire****